

HP Vectra VL
series 6

User's Guide

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User's Guide

Who this Manual is For

This manual is for anyone who wants to:

- Set up the PC for the first time
- Configure the PC
- Add accessories to the PC
- Troubleshoot problems on the PC
- Find out where to get more information and support.

Important Safety Information

If you have any doubt that you can lift the PC or display safely, do not try to move it without help.

For your safety, always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with this equipment, or one in compliance with your national regulations. This PC is disconnected from the power by removing the power cord from the power outlet. This means the PC must be located close to a power outlet that is easily accessible.

For your safety, never remove the PC's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover on the PC before switching it on again.

WARNING

To avoid electric shock, do not open the power supply.

This HP PC is a class 1 laser product. Do not attempt to make any adjustment of the laser units.

Important Ergonomic Information

It is strongly recommended that you read the ergonomic information before using your PC.

For Windows NT 4.0 users, open the Start menu in the task bar and select Help. Then double-click on the help topic “Working in Comfort”.

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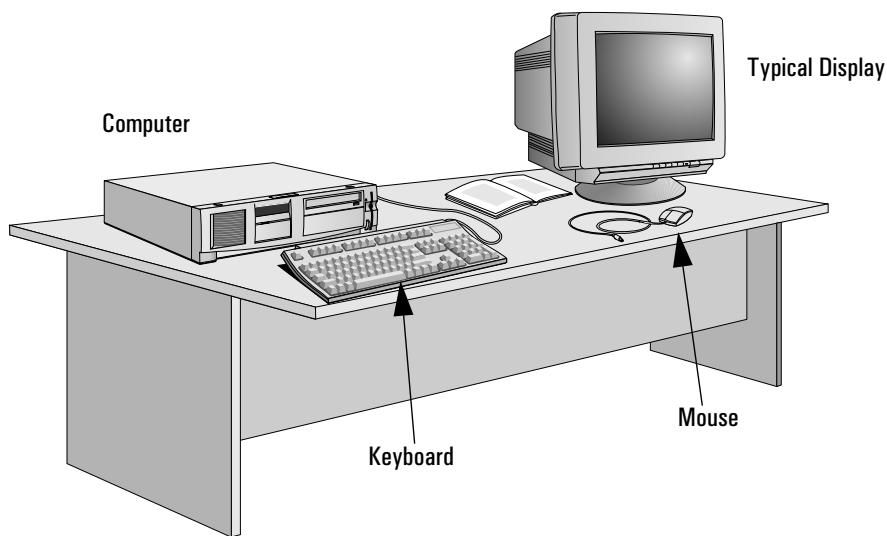
Setting Up and Using Your PC

1 Setting Up and Using Your PC

Unpacking Your PC

WARNING

If you have any doubt that you can lift the PC or display safely, do not try to move it without help.



- 1 When you receive your PC, unpack all the components.
- 2 Place the PC on a sturdy desk near to easily accessible power outlets, with enough space for the keyboard, mouse, and any other accessories. You can either place the PC horizontally (flat on the desk) or vertically (on its side), with the flexible disk drive at the top.
- 3 Position the PC so that its rear connectors are easily accessible.
- 4 Refer to the display's manual for information about the display.

Operating System

Your PC's operating system is preloaded on your PC's hard disk drive.

Installation Tools

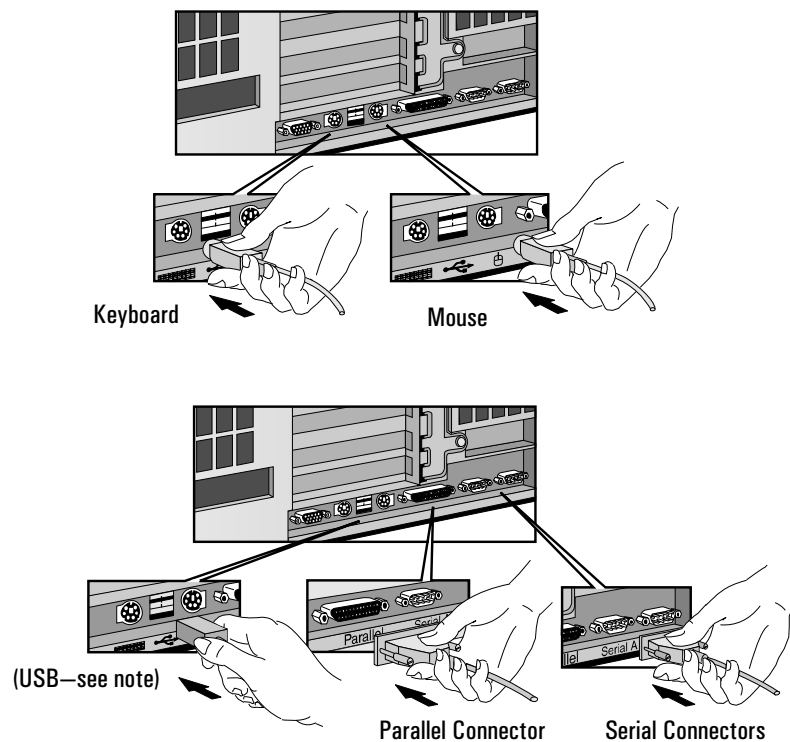
No tools are required to set up your PC. However, if you plan to install a disk drive, you may need a screwdriver. For further information about installing accessories, refer to chapter 2, *"How to Install Accessories In Your PC"*.

Connecting the Mouse, Keyboard and Printer

Connect the mouse and keyboard to the back of the computer. *The connectors are shaped to go in one way only.*

Connect the printer cable to the back of the computer and tighten the attachment screws. Use the connector labeled:

- Parallel (25-pin parallel connector) for a parallel device
- Serial A (9-pin serial connector) for a serial device
- Serial B (9-pin serial connector) for a second serial device.



NOTE

The Universal Serial Bus (USB) connectors can be used for USB accessories. Most USB accessories are automatically configured as soon as they are physically attached to the PC. USB is not supported by all operating systems.

1 Setting Up and Using Your PC

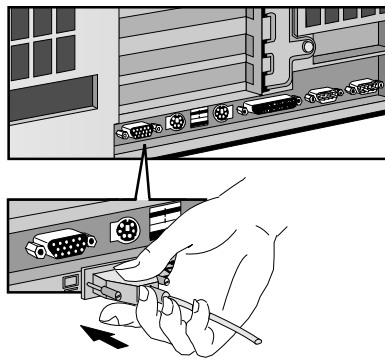
Connecting the Display

Connecting the Display

Connect the display to the back of the computer. *The connectors are shaped to go in one way only.* Tighten the display cable attachment screws.

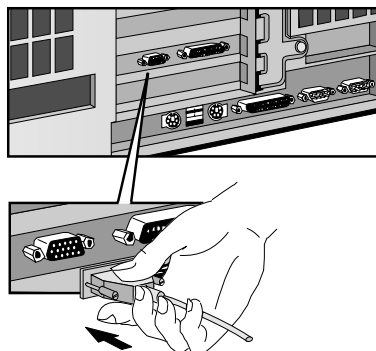
Models with Integrated Video Controller

If your PC has an integrated video controller, use the following display connector.



Models with Millennium Video Board

If your PC has a Millennium video board, use the following display connector.

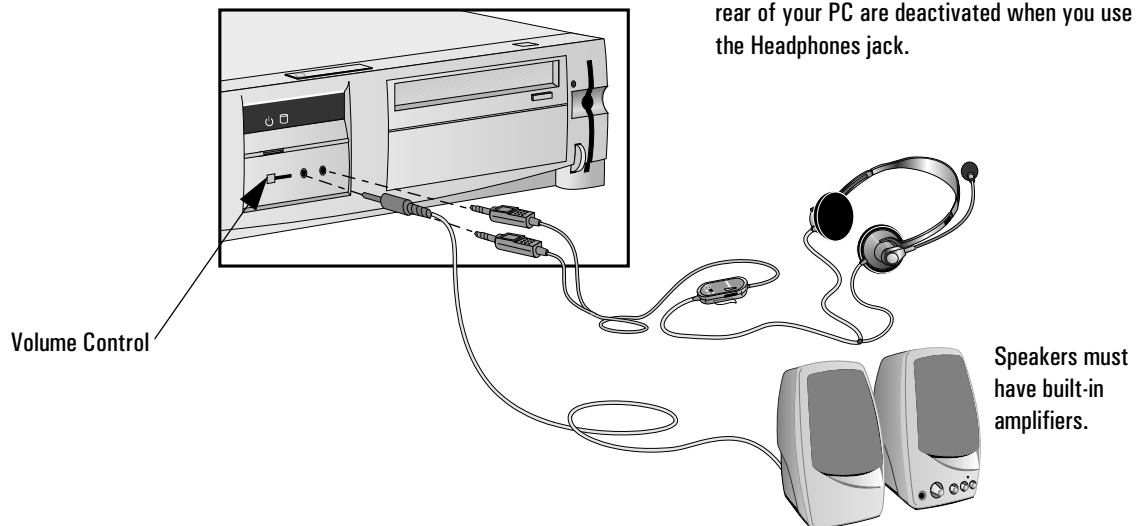


Connecting Audio Accessories

If your PC has multimedia capabilities, it will have a multimedia front panel and multimedia rear panel. The front panel has a headphones/speaker jack, a microphone jack, and a volume control

NOTE

The internal speaker and the Line Out jack on the rear of your PC are deactivated when you use the Headphones jack.



The audio accessories shown here (audio headset and speakers) are not supplied with your PC.

WARNING

To avoid discomfort from unexpected noise, always turn the volume down before connecting headphones or speakers. Listening to loud sounds for prolonged periods may permanently damage your hearing. Before putting on headphones, place them around your neck and turn the volume down. When you put on the headphones, slowly increase the volume until you find a comfortable listening level, and leave the volume control in that position.

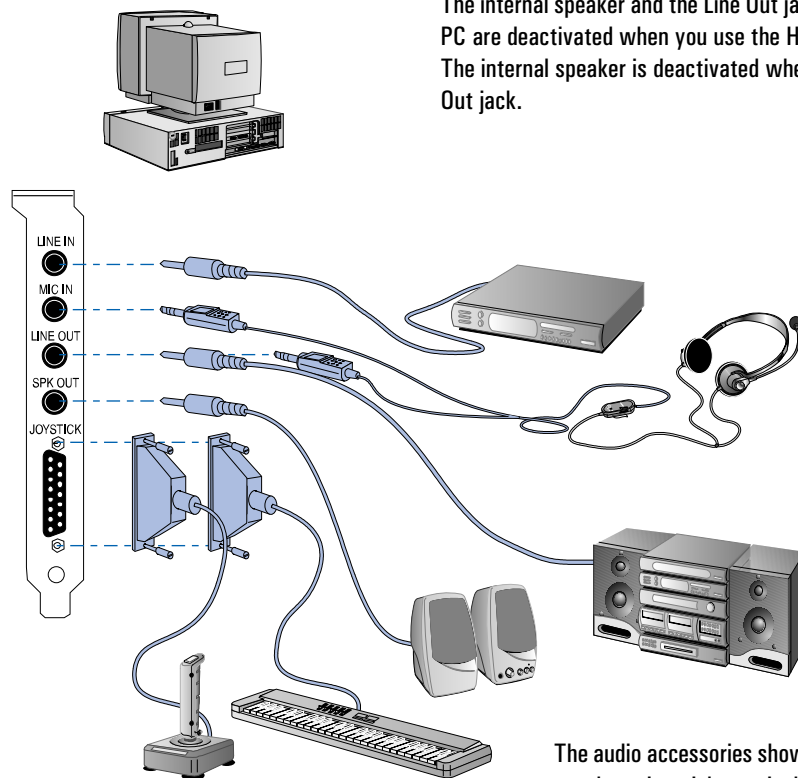
1 Setting Up and Using Your PC

Connecting Audio Accessories

The multimedia rear panel has an audio Line In jack, an audio Line Out jack, and a MIDI interface connector (“JOYSTICK”). An additional headphones jack and an additional microphone jack is also on the rear panel.

NOTE

The internal speaker and the Line Out jack on the rear of your PC are deactivated when you use the Headphones jack. The internal speaker is deactivated when you use the Line Out jack.



The audio accessories shown here (microphone, speakers, joystick, musical instrument, and hifi equipment) are not supplied with your PC.

WARNING

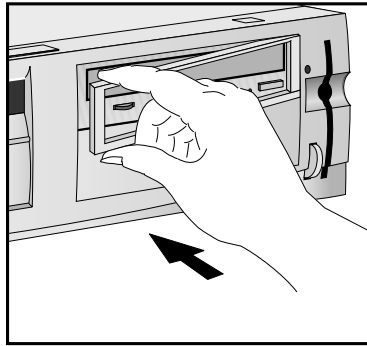
To avoid discomfort from unexpected noise, always turn the volume down before connecting headphones or speakers. Listening to loud sounds for prolonged periods may permanently damage your hearing. Before putting on headphones, place them around your neck and turn the volume down. When you put on the headphones, slowly increase the volume until you find a comfortable listening level, and leave the volume control in that position.

1 Setting Up and Using Your PC

Connecting Audio Accessories

If your PC does not have multimedia capabilities and you want to listen to audio CDs on your CD-ROM drive, you can use the headphones jack and the volume control on the front of the CD-ROM drive. To access these controls:

- 1 Remove the CD-ROM drive's front bezel by carefully pulling it off.
- 2 Replace it with the universal front bezel.



You will find a spare universal front bezel inside your PC (refer to page 38), or you can order one from an authorized HP reseller.

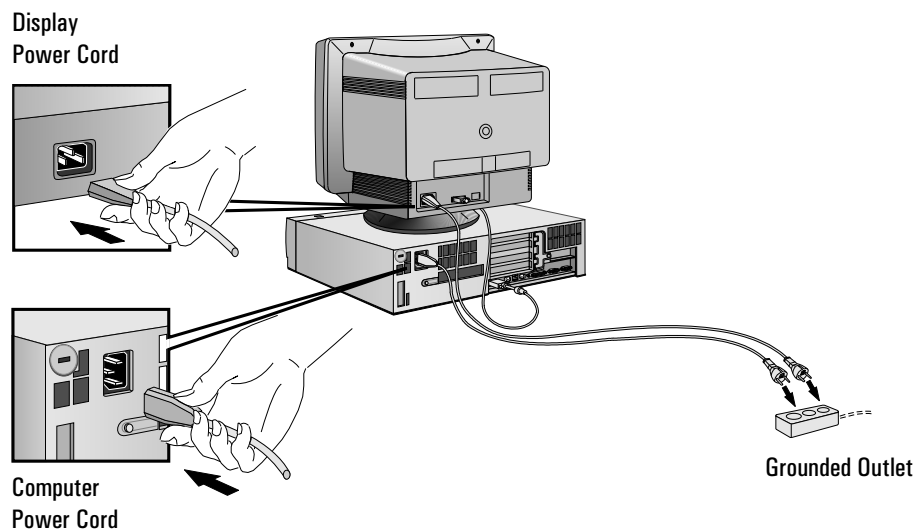
1 Setting Up and Using Your PC

Connecting the Power Cables

WARNING

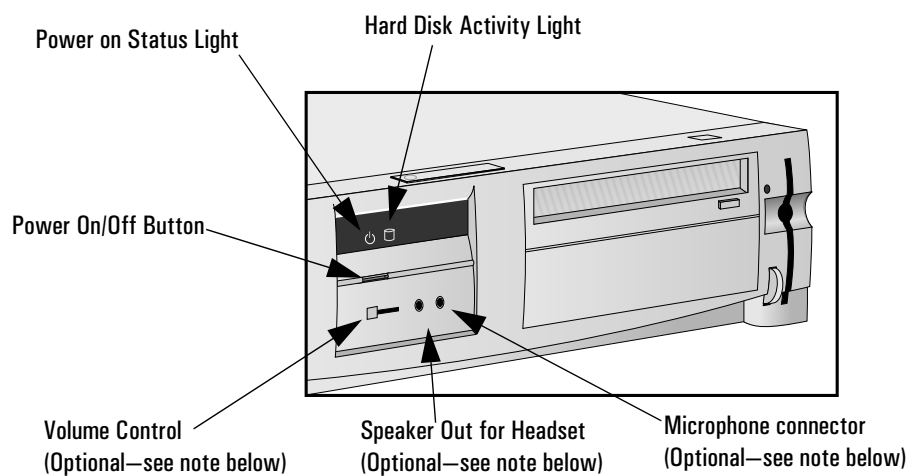
For your safety, always connect the equipment to a grounded wall outlet. Always use a power cable with a properly grounded plug such as the one provided with this equipment or in compliance with your national regulations. This PC is disconnected from the power by removing the power cable from the power outlet. This means the PC must be located close to a power outlet that is easily accessible.

- 1 Connect the power cords to the display and the computer. (*The connectors are shaped to go in one way only.*)
- 2 Connect the display's power cord and the computer's power cord to a grounded outlet.



Your PC's Hardware Control Panel

Your PC's hardware control panel is on the front of your PC.



Power On/Off Button Press this button to turn the power on or off to your PC.

Hard Disk Activity Light This light glows/flickers when your hard disk drive is being accessed. The hard disk activity light will also work if you install a second IDE hard disk drive (supplied by HP). However, if you replace this drive with a SCSI hard disk drive, this light will not work.

NOTE If your PC comes with an audio board, the front panel will have controls for the audio board.

1 Setting Up and Using Your PC

Starting and Stopping Your PC

Starting and Stopping Your PC

NOTE

If you are starting your PC for the first time, refer to "Starting the PC for the First Time", on page 11.

Starting Your PC

- 1 Before you start your PC, first switch on the display.
- 2 Start your PC in one of these ways:
 - Press the power button on the front panel.
 - Press the keyboard space bar.

The keyboard power-on feature will work only if it is enabled in the *Setup* program (refer to page 66) and the system board switch 8 is CLOSED (refer to page 62).

When you switch on the computer, it carries out the Power-On-Self-Test (POST) while the Vectra logo is displayed. If you wish to view the POST details, press **Esc** to get the HP Summary Screen. If there is an error in the POST, the error will automatically be displayed. For details, refer to "If a POST Error Message is Displayed", on page 47.

- 3 If you have set a password in the PC's *Setup* program, the password prompt displays after the POST has completed. If the Password prompt is displayed, type your password and press **Enter** to be able to use the PC.

Starting the PC for the First Time

If your PC has preinstalled software, it is initialized the first time you start the PC. The software initialization process takes a few minutes. This process sets up the software in your language and sets up your software to use the hardware installed in your computer (you can change the settings after the software has been initialized).

Choice of Operating System

For the best performance and reliability, you must specify which operating system is used by your PC.

If you are using Windows 95, set the **Windows 95** field in the **Main** menu of the *Setup* program to **Yes**. For all other operating systems, set this field to **No**. To learn how to access the PC's *Setup* program, refer to "HP Setup Program", on page 58.

Changing the operating system

If you change the operating system used by your PC, ensure that the **Windows 95** field in the *Setup* program is correctly set.

Initializing Your Software

NOTE

Do NOT switch OFF the PC while the software is being initialized—this could cause unexpected results.

To initialize your software:

- 1 Turn on the display first, and then the PC.

When the PC is switched on, the Vectra Logo is displayed. The PC performs a Power-On-Self-Test (POST). Press **[Esc]** if you want to view the POST details in the HP Summary Screen (refer to the "HP Setup Program", on page 66).

If an error is detected during the Power-On-Self-Test, the PC will automatically display the error. You may be prompted to press **[F2]** to start the *Setup* program to correct the error.

1 Setting Up and Using Your PC

Starting and Stopping Your PC

- 2 The software initialization routine starts. It displays the software license agreement, gives you an opportunity to read Working in Comfort (ergonomic advice for computer users), and then asks questions about the PC. For example:
 - The name of the person who will use the PC and your company name. (If necessary, the name of the user can be modified later.)
 - The current date and time.
 - The type of printer (for example, HP LaserJet 5L). This is shown on the front of the printer. You also need to enter the connection used by the printer.
- 3 While the initialization program is running, you can complete the Warranty Registration card that came with this manual.
- 4 When the initialization routine has finished, click on OK and the PC will restart.

After Your PC Has Restarted

- ☐ Set the keyboard to a comfortable position.
- ☐ Adjust the display screen's brightness and contrast to suit your needs. If the picture does not fill the screen or is not centered, adjust it using the controls on the display. Refer to the display's manual for details.

Stopping Your PC

To stop the PC, make sure that you have exited all programs and the operating system (if necessary), and then press the power button on the control panel.

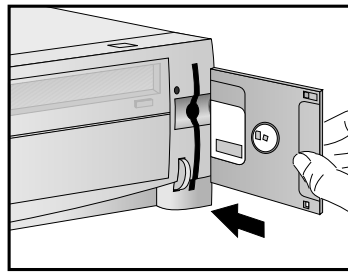
Stopping Your PC in Windows NT 4.0

With some operating systems, such as Windows NT 4.0, the PC will automatically switch off when you shut down the operating system.

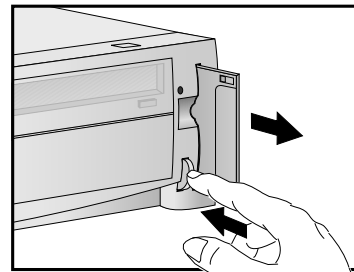
Refer to the operating system manual for details of how to shut down or exit the operating system.

Using the Flexible Disk Drive

Your PC has a flexible disk drive for 3½-inch flexible disks. Ensure that you insert the flexible disk correctly when using the drive.



Inserting a disk




Ejecting a disk

Setting Passwords

You can set two passwords, the Administrator password and the User password, to provide two levels of protection for your PC. You set both passwords in the Security menu group of the *Setup* program.



Setting an Administrator Password

Set the Administrator password to protect the PC's configuration in *Setup*. An Administrator password can provide a power-on password prompt to prevent your PC being started or used in your absence. You can also use this password to start the PC when the keyboard (and mouse) are locked—you must type the password and press  to unlock the keyboard (refer to "Power-On Password", in the HP *Setup* program—refer to "HP Setup Program", on page 66).

If you have set both an Administrator password and a User password, and you enter the *Setup* program by using the User password, you will be restricted in your ability to change setup items. If you enter the *Setup* program with an Administrator password, you will have no restrictions.

To set an Administrator Password:

- 1 Start the Setup Program. Refer to "HP Setup Program", on page 66.
- 2 Select the Security menu group.
- 3 Select the "Administrator Password" submenu.
- 4 Choose the "Set Administrator Password" setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting "Exit", then "Save and Exit".

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press . To confirm your choice, press  a second time.


NOTE

If you forget your password, refer to "If You Have Forgotten Your Password", on page 56.

Setting a User Password

A User password can only be set if an Administrator password has already been set.

Set a User Password to:

- provide a power-on password prompt to prevent your PC being started or used in your absence
- start the PC when the keyboard (and mouse) are locked—you must type the password and press  to unlock the keyboard (refer to "Power-On Password", in the HP *Setup* program—refer to "HP Setup Program", on page 66).


If you have set both an Administrator password and a User password, and you enter the *Setup* program by using the User password, you will be restricted in your ability to change setup items. If you enter the *Setup* program with an Administrator password, you will have no restrictions.

To set a User Password:

- 1 Start the Setup Program. Refer to "HP Setup Program", on page 66.
- 2 Select the Security menu group.
- 3 Select the "User Password" submenu.
- 4 Choose the "Set User Password" setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting "Exit", then "Save and Exit".

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press

.

To confirm your choice, press  a second time.

NOTE

If you forget your password, refer to "If You Have Forgotten Your Password", on page 56.

Using Power Management

Power management enables you to reduce the PC's overall power consumption by slowing down the PC's activity when it is idle. To configure power management, refer to "Power Menu Items" in the HP Setup program (refer to "HP Setup Program", on page 66).

Refer to your operating system documentation for detailed information about the capabilities of your operating system to implement power management.

Additional Information and Help

Additional information about your PC is preloaded on your PC's hard disk drive. This information includes:

- New features—what is new and special about your PC
- Using your PC—simple, “how-to-use” guidelines about using your PC
- Working in comfort—guidance on ergonomic issues
- Inside your PC—describes the basic parts of your PC and how to optimize performance
- HP support—similar to chapter 4 in this User's Guide
- Glossary.

For Windows NT 4.0 users, you can access this information by opening the Start menu in the task bar and selecting Help.

How to Install Accessories In Your PC

This chapter explains how to install accessories, such as extra memory, accessory boards, and additional disk drives, in your PC.

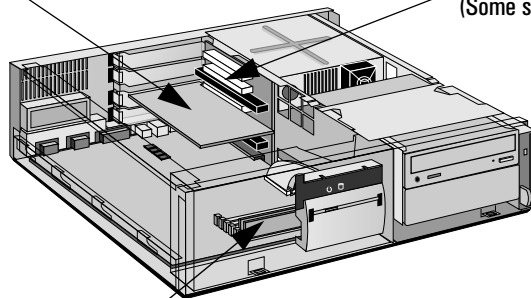
Accessories You Can Install

Video Memory Upgrade

(Models with Millennium board only)

Up to Four Accessory Boards

(Some slots may come with pre-installed boards)



Main Memory Modules (32-bit EDO):

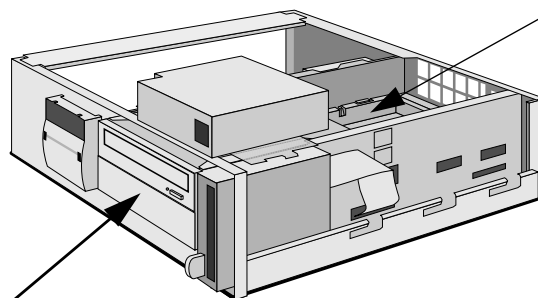
8 MB kit (2 × 4 MB modules)

16 MB kit (2 × 8MB modules)

32 MB kit (2 × 16 MB modules)

64 MB kit (2 × 32 MB modules)

(Pairs of identical modules must be installed. Use only HP-supplied memory modules that have been certified for this PC.)



One Free Internal Mass
Storage Shelf
or
Supplementary ISA
Accessory Board Slot

One or Two Free Front-Access Device Shelves

Zip Drive

Tape Drive

CD-ROM Drive (already installed on some models)

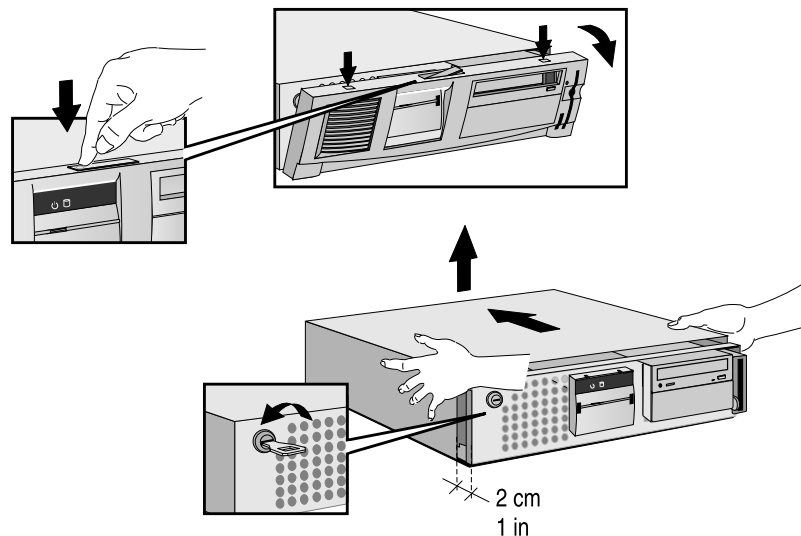
Removing and Replacing the Cover

WARNING

For your safety, never remove the PC's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover before switching the PC on again.

Removing the Cover

- 1 Switch off the display and the PC.
- 2 Disconnect the power cords from the power outlets, the PC, and the display. Disconnect any connection to a telecommunications network.
- 3 Press the central latch down to unlock the front panel.
- 4 Remove the front panel by pressing the two tabs down, pivoting the front panel downward, and lifting it off.
- 5 If necessary, unlock the cover using the key provided with the PC.
- 6 Placing your hands on the sides of the cover, push the cover forward by about 2 cm (about 1 inch) and lift it off.

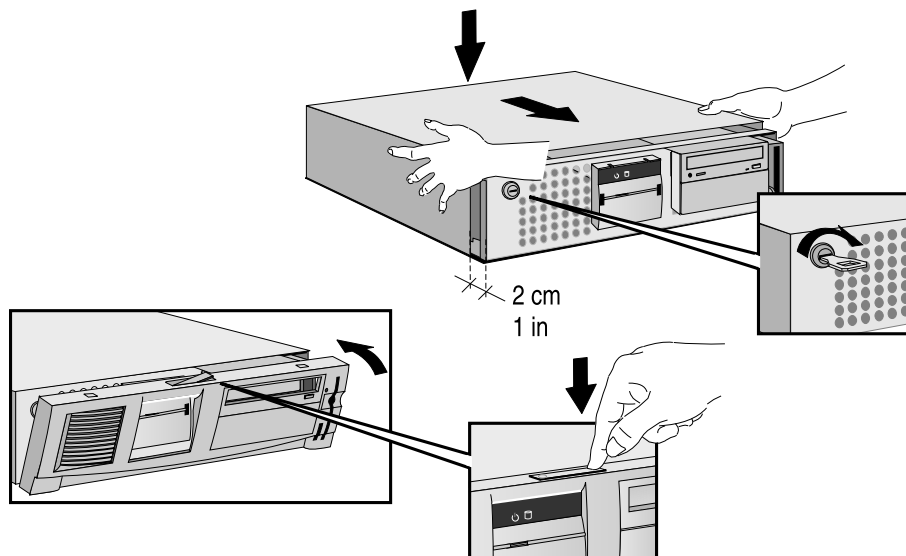


2 How to Install Accessories In Your PC

Removing and Replacing the Cover

Replacing the Cover after Installing Accessories

- 1 Check that you have installed all your accessories.
- 2 Make sure that all internal cables are properly connected and safely routed so they will not be entangled when you replace the cover.
- 3 Ensure that the cover lock is unlocked.
- 4 Lower the cover onto the computer (aligning the front of the cover with the inner front edge of the computer frame), and firmly slide it forwards into position.
- 5 If required, lock the cover using the key.
- 6 Replace the front panel by first inserting the two lower hinges then pivoting it upwards into place. The two tabs will click into place.



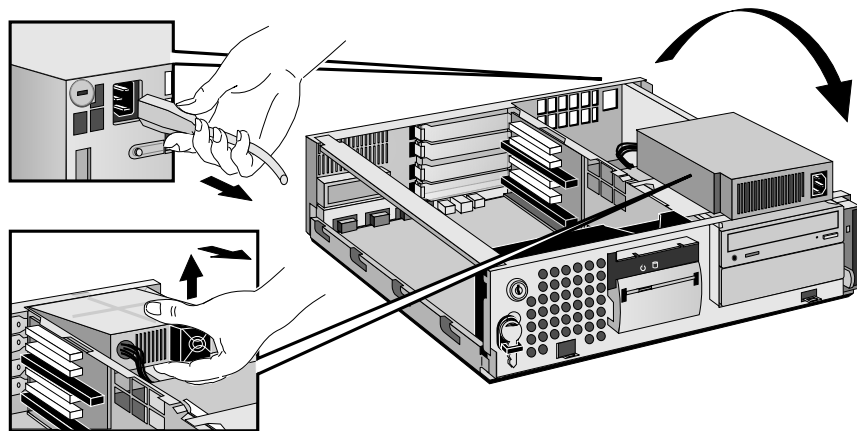
- 7 Close the central latch on top of the front panel.
- 8 Reconnect all cables and power cords.

Moving and Replacing the Power Supply

You must move the power supply to access the rear drive shelves and the additional accessory board slot. Removing the power supply also improves access to the drive connectors and cables.

Moving the Power Supply

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network. Remove the computer's cover.
- 2 Lift the front of the power supply to free the two side catches then slide it horizontally out. Lift the power supply clear and lay it upside down on the front drive unit.

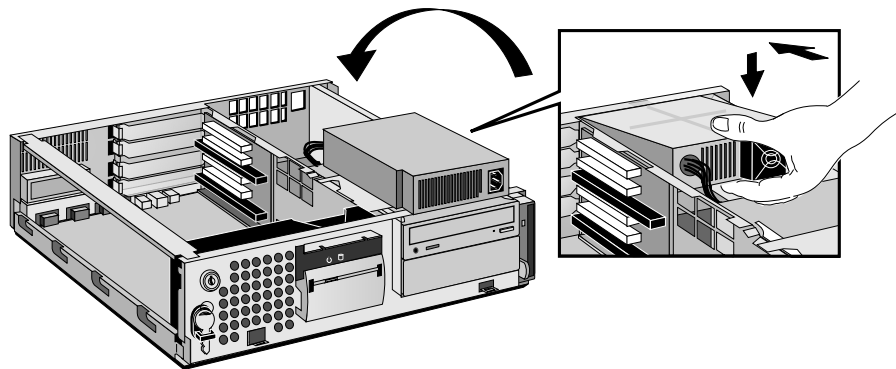


2 How to Install Accessories In Your PC

Moving and Replacing the Power Supply

Replacing the Power Supply

- 1 Before replacing the power supply, ensure that all new drives have been correctly installed and that all data and power cables are properly connected and correctly routed.
- 2 Lift the front of the power supply (the fan end) and slide it into the rear of the PC. Ensure that the hinge on the back of the power supply engages the notch on the chassis. Then lower the front of the power supply so that the catch on either side slides into place.



- 3 Always replace the PC's cover before connecting the power cable.

Installing Memory

CAUTION

Static electricity can damage electronic components. Turn all equipment OFF. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the PC while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

Installing Main Memory

Your PC is supplied with main memory. If you need more main memory to run your application software, you can install up to a total of 192 MB (6 × 32 MB).

Main memory is available in modules of 4 MB, 8 MB, 16 MB, or 32 MB. There are three memory "banks", with each bank requiring two memory modules. You must install identical modules as pairs in each bank.

Bank	Memory Modules You can Install
A1 and A2	Comes preloaded with memory in this bank, such as 32 MB (2 × 16 MB).
B1 and B2	Any pair of identical modules.
C1 and C2	Any pair of identical modules.

NOTE

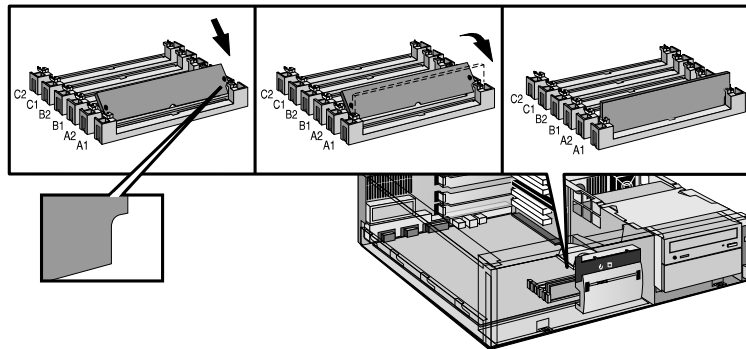
Best performance is achieved if you install memory in bank A first, then bank B, and in bank C last. Bank A is at the front of the PC and bank C is towards the rear.

2 How to Install Accessories In Your PC

Installing Memory

To install a main memory module:

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover (refer to page 19).
- 3 Slide the memory module into the slot at 45°, ensuring that the notch on the memory module faces the drive bay. Pivot the memory module to a perpendicular position and click into place.

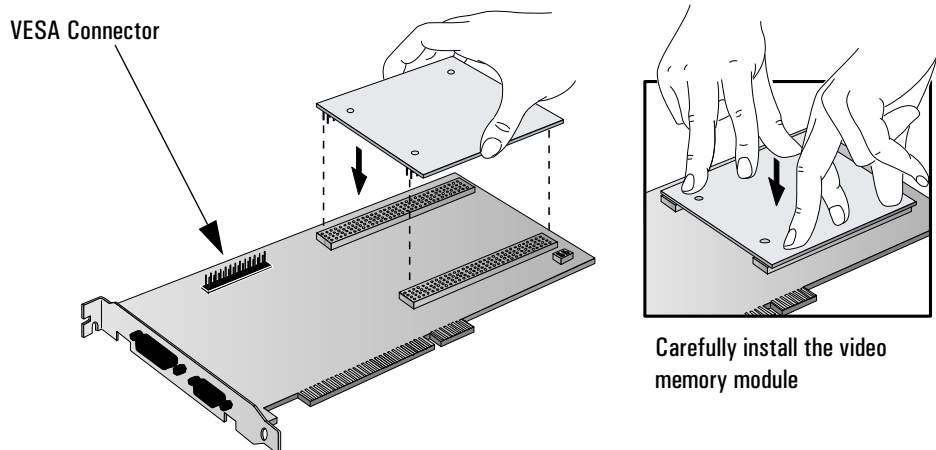


- 4 If you need to remove a main memory module, release the retaining clips, pivot the module forward, and pull it out of the socket.
- 5 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 6 Check the HP Summary Screen to verify the new configuration (refer to page 44).

Upgrading the Millennium Board Memory

If your PC has the Millennium video board instead of integrated video memory, you can increase its memory to get more colors and better video resolution.

- 1 Switch off the display and computer, and disconnect the power supply cables and any telecommunications cables. Remove the computer's cover.
- 2 Remove the retaining bracket from the rear of the PC (you can use a coin to unscrew it). Note which slot the board is in.
- 3 Carefully remove the board from its slot, holding the board at each end by its top edge. Do not bend the board. With its components facing up, place the board on a clean, flat, solid, static-free surface. Handle the board by its edges.
- 4 Install the memory module on the video board. Carefully slide the board back into its slot. Firmly press the board into the socket. Make sure that the board slides into the socket completely and does not touch components on other boards. Secure the board by replacing the retaining bracket.



2 How to Install Accessories In Your PC

Installing Memory

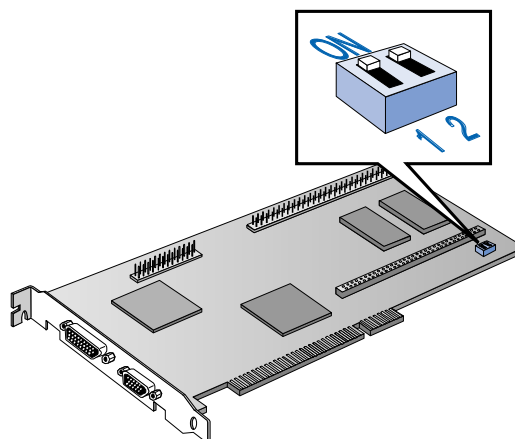
- 5 Install any other accessories before replacing the cover and reconnecting the cables.
- 6 After switching on the PC, you can change the video resolution and the number of colors displayed, if required. Alternatively, you can use utilities supplied with the operating system. See your operating system documentation and online help for more information.

If You Have a MGA Millennium Board

The MGA Millennium board has two configuration switches.

Switch	Use Switch Block to:
1	Flash EEPROM Switch for VGA BIOS: <ul style="list-style-type: none">• OFF to prevent Video BIOS upgrades — DEFAULT• ON to allow Video BIOS upgrades.
2	Enable or disable VGA for single-screen or dual-screen operation (with a second VGA controller): <ul style="list-style-type: none">• OFF for single-screen operation — DEFAULT• ON for dual-screen operation (with a second VGA controller).

Contact your HP representative for further information about upgrading the video BIOS.



Installing Mass Storage Devices

You can install additional mass storage devices, if you need extra mass storage space for your application software.

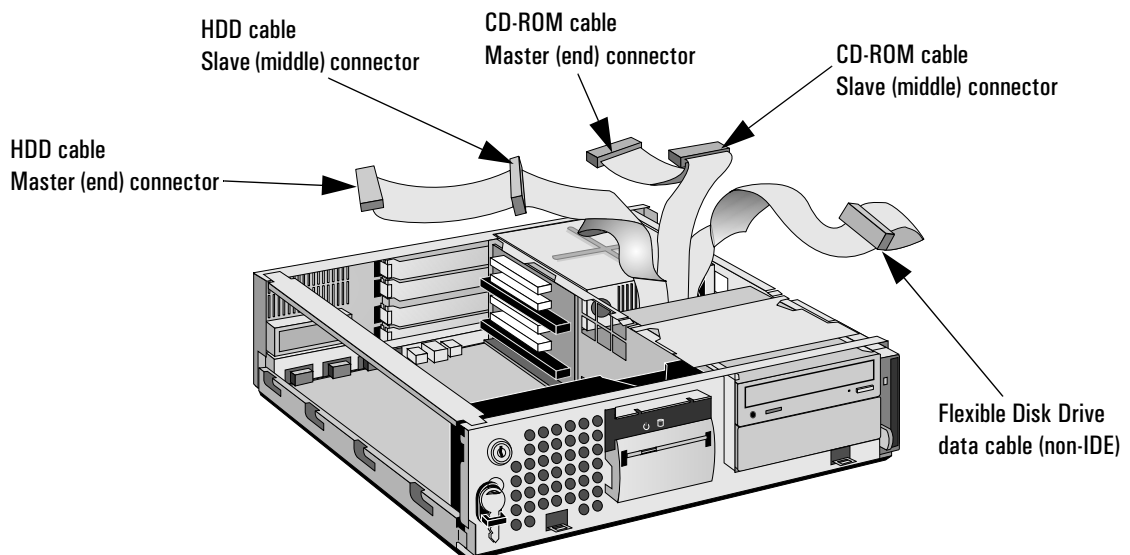
NOTE

You can install a non-IDE hard disk drive or CD-ROM device, but it will need an accessory board and driver software (usually supplied with the device). Contact the product vendor for further information.

Connecting IDE Devices

There are three data cables inside your PC. Two of these are for IDE devices:

- The first cable is marked “HDD” and has two drive connectors for connecting hard disk drives. The end connector of this data cable must be connected to the bootable or master hard disk drive.
- The second data cable is marked “CD-ROM” and has two drive connectors. This cable can be used for a CD-ROM drive, a Zip drive, or a third hard disk drive.



2 How to Install Accessories In Your PC

Installing Mass Storage Devices

Up to four IDE devices can be connected to the system board using these data cables. (Refer to the storage device's manual to check whether you need to set jumpers, or if there are any special installation procedures.)

Examples of multiple IDE drive combinations		
Configuration	Connections to data cables	
1 Hard disk drive	1. Bootable hard disk drive:	Master connector, HDD Cable
2 Hard disk drives	1. Bootable hard disk drive:	Master connector, HDD Cable
	2. Second hard disk drive:	Slave connector, HDD Cable
1 Hard disk drive 1 CD-ROM drive	1. Bootable hard disk drive:	Master connector, HDD Cable
	2. CD-ROM drive:	Master connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive	1. Bootable hard disk drive:	Master connector, HDD Cable
	2. Second hard disk drive:	Slave connector, HDD Cable
	3. CD-ROM drive:	Master Connector, CD-ROM Cable
1 Hard disk drive 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive:	Master connector, HDD Cable
	2. CD-ROM drive:	Master connector, CD-ROM Cable
	3. Zip drive:	Slave connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive:	Master connector, HDD Cable
	2. Second hard disk drive:	Slave connector, HDD Cable
	3. CD-ROM drive:	Master connector, CD-ROM Cable
	4. Zip drive:	Slave connector, CD-ROM Cable

Jumper Settings

Refer to the IDE drive's manual to see if you must set jumpers. The drive jumper should be set to "cable select".

Configuring an IDE Device After Installation

After installing a second IDE drive, or after installing any flexible disk drive, you will need to verify that your PC has correctly identified the new configuration, by viewing the HP Summary Screen. Refer to page 44. If the configuration is not correct, run the *Setup* program to configure the device. Refer to "HP Setup Program" on page 66.

IDE drives are automatically detected by the *Setup* program. However, a newly installed CD-ROM may require that you install an appropriate device driver. Refer to your operating system documentation for details. For information on how to obtain the latest available drivers from HP, refer to page 73.

Installing an IDE Hard Disk Drive in the Top Rear Shelf

The top rear shelf is located under the power supply. You can use this shelf for a 3.5-inch hard disk drive. You can also use the top rear shelf for installing an ISA accessory board.

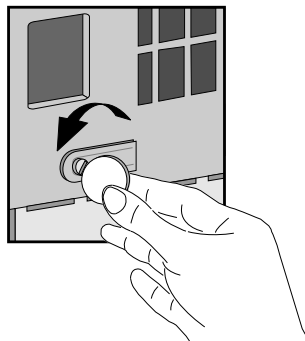
The PC has an integrated Enhanced IDE controller which supports two Fast IDE hard disk drives. Refer to the drive's manuals to see if you must set jumpers or if there is a special installation procedure to follow

CAUTION

Handle the hard disk drive with care. Avoid shocks and violent movement as this can cause damage to the hard disk drive's internal components.

Make sure that you back up your files before you install a hard disk drive. Refer to your operating system documentation for information on how to do this.

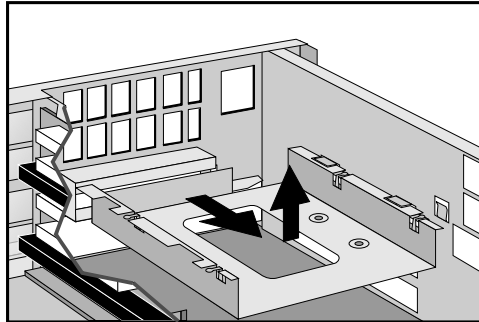
- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover and power supply.
- 3 At the rear of the computer, unscrew the retaining bracket (you can use a coin to do this) and remove it.



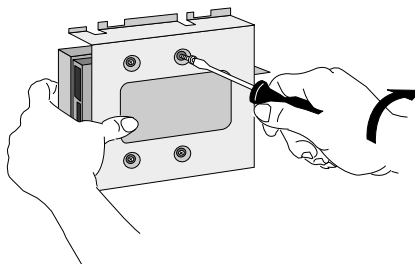
2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 4 Remove the rear tray by sliding it forward about 1.5 cm ($\frac{1}{2}$ inch) and lifting it up and out.



- 5 Align the disk drive with the holes in the tray, making sure that the drive connectors are on the open end of the tray. Then secure the drive using the screws provided with it.

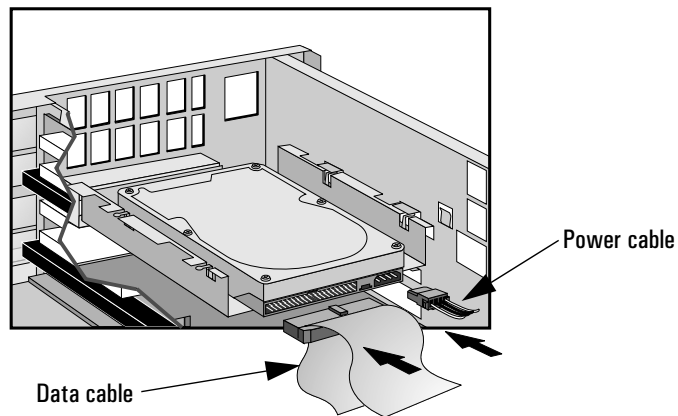


- 6 Carefully lower the tray back into position by aligning the metal tabs, then slide it backwards into place.
- 7 At the rear of the PC, replace the retainer bracket and screw it in place, securing the tray.

2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 8 Connect the power cable and the data cable to the rear of the drive. *The connectors are shaped to go in one way only.* If you are not sure which connector to use, refer to "Connecting IDE Devices", on page 27.



- 9 Install any other accessories before replacing the power supply and cover. Reconnect all cables and power cords.
- 10 Verify the new configuration by checking the HP Summary Screen (refer to page 44).

2 How to Install Accessories In Your PC

Installing Mass Storage Devices

Installing an IDE Hard Disk Drive in the Bottom Rear Shelf

The PC has an integrated Enhanced IDE controller which supports two Fast IDE hard disk drives. Refer to the drive's manuals to see if you must set jumpers or if there is a special installation procedure to follow.

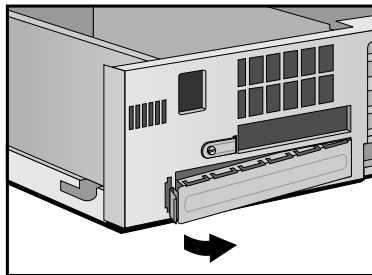
You can install either a 3.5-inch or a 5.25-inch hard disk drive in this shelf. It is recommended that you use the bottom rear shelf if you want to replace the existing hard disk drive. You can use the top rear shelf (located under the power supply) if you want to install a second hard disk drive.

CAUTION

Handle the hard disk drive with care. Avoid shocks and violent movement as this can cause damage to the hard disk drive's internal components.

Make sure that you back up your files before you install a hard disk drive. Refer to your operating system documentation for information on how to do this.

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover and power supply.
- 3 At the rear of the computer, unlatch the metal plate and remove it.

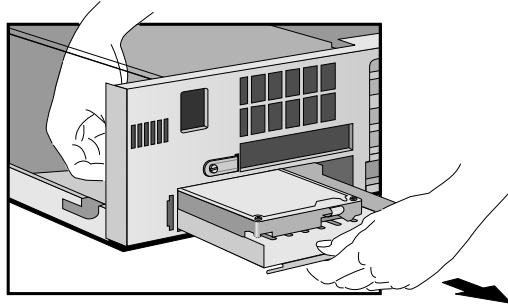


- 4 If there is a disk drive on the bottom tray (and you want to replace it), disconnect the power cable and data cable from this drive.

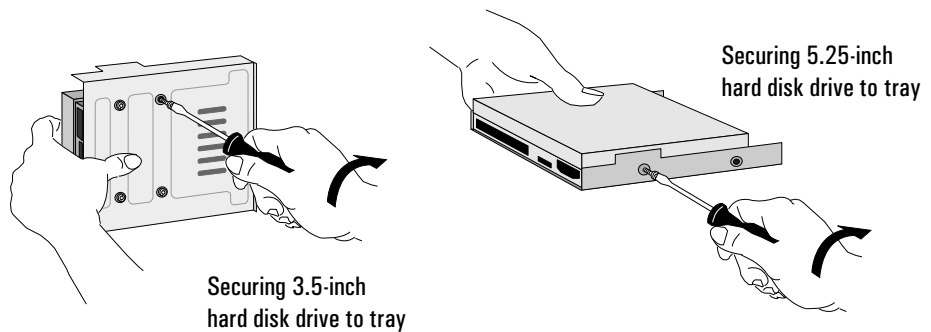
2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 5 Remove the tray by pushing it from the inside and sliding it out the back of the computer.



- 6 If there is a disk drive on the tray (and you want to replace it), remove the drive by unscrewing it from the back of the tray.
- 7 Secure the new drive onto the tray with the screws provided. Ensure that the drive connectors face the correct way.

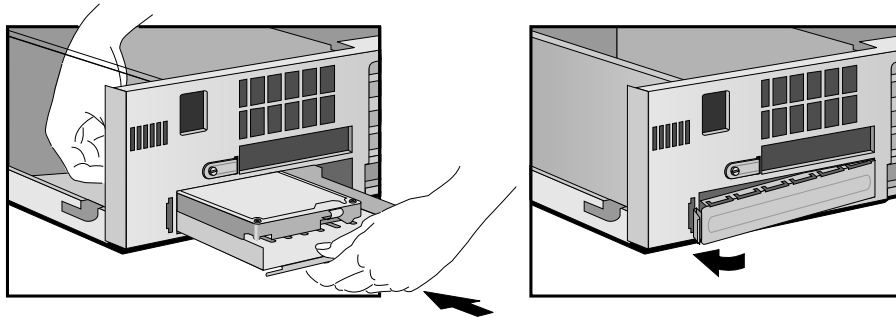


- 8 Slide the tray back into the rear of the computer, pushing it firmly into position.

2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 9 At the rear of the computer, replace the metal plate. Insert the flat end first then push it until it clicks into place.



- 10 Connect the power cable and the data cable to the rear of the drive. *The connectors are shaped to go in one way only.* If you are not sure which connector to use, refer to "Connecting IDE Devices", on page 27.
- 11 Install any other accessories before replacing the power supply and cover. Reconnect all cables and power cords.
- 12 Verify the new configuration by checking the HP Summary Screen (refer to page 44).

Installing a CD-ROM, Tape or Zip Drive in a Front Shelf

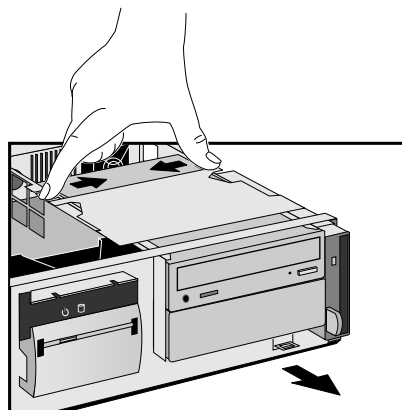
WARNING

To avoid electric shock and harm to your eyes by laser light from a CD-ROM drive, do not open the CD-ROM drive enclosure. The drive should be serviced by authorized service personnel only.

The PC has an integrated Enhanced IDE controller which supports up to four IDE devices. Removable media IDE devices, such as CD-ROM drives, tape drives and Zip drives, require front access. You can install a removable media IDE drive in the bottom front shelf.

Refer to the drive's manual to see if you must set jumpers or if there is a special installation procedure to follow.

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Press the two retaining clips (indicated by ① on the label on your PC) of the front drive unit inward and slide the unit forward about halfway.

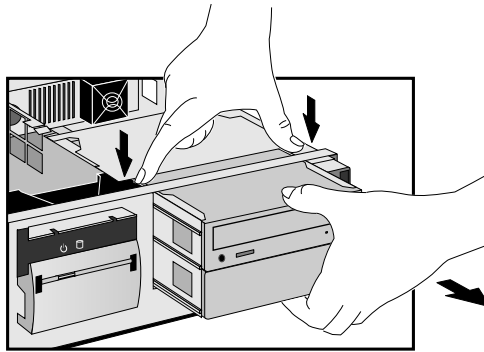


- 4 Remove any data and power cables connected to the rear of the devices in the front drive unit. (Most models have a CD-ROM drive.)

2 How to Install Accessories In Your PC

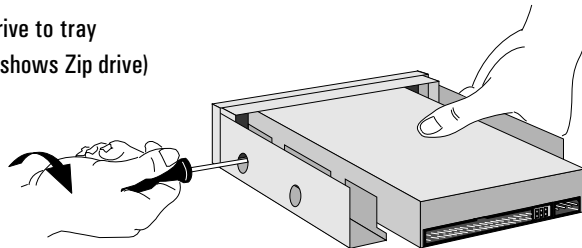
Installing Mass Storage Devices

- 5 Push the two catches (indicated by ③ on the label on your PC) on the front drive unit down and then slide the unit out, holding it with both hands.



- 6 Carefully place the unit on its side and remove the top mounting bracket. Remove the metal filler plate from the empty shelf if there is one.
- 7 If the drive to install has a tray, attach the drive onto the tray. Many devices, such as the HP Zip drive, require an HP-supplied tray before they can be installed. CD-ROM drives do not require a tray.

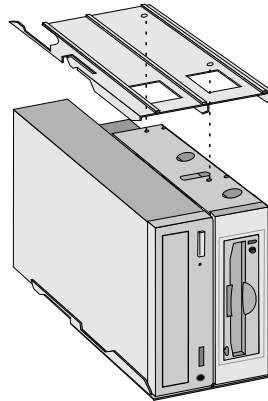
Attach drive to tray
(Example shows Zip drive)



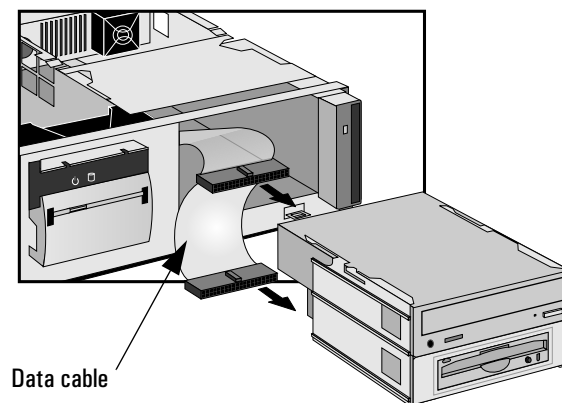
2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 8 Lower the drive into the free groove of the mounting bracket (ensure that the top of the drive is faces the right way). Use the two pins on the mounting bracket to slot the drive into place.



- 9 Position the other mounting bracket on top, aligning it properly so that it clicks into place.
- 10 Draw the computer's data cable through the front drive bay area and connect the data cable to the rear of each drive.
The connectors are shaped to fit one way only. If you are not sure which connector to use, refer to "Connecting IDE Devices", on page 27.

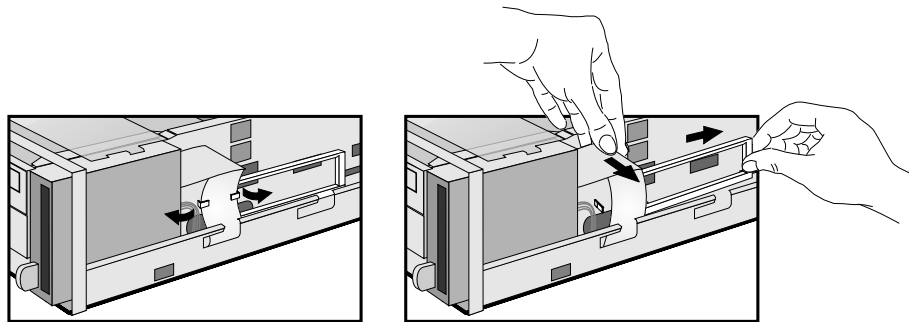


- 11 Using both hands, lift the drive unit and slide it back into the computer about halfway.

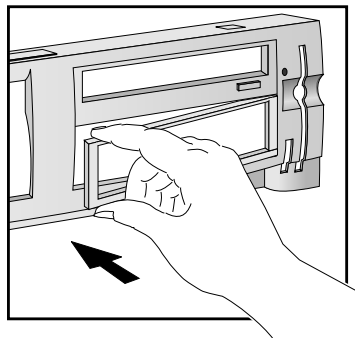
2 How to Install Accessories In Your PC

Installing Mass Storage Devices

- 12 Remove the power supply and place it upside down on the front drive unit.
- 13 Connect the power cable to the rear of each drive.
The connectors are shaped to fit one way only.
- 14 Replace the power supply. Then push the front drive unit fully into the computer until the two retaining clips click into place.
- 15 Retrieve the universal front bezel from the PC's chassis by opening the two clips. (The universal front bezel for your PC can also be ordered from any authorized HP reseller.).



- 16 Remove the filler bezel from the PC's front panel and replace it with the universal front bezel to give access to the newly installed drive.



- 17 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 18 Verify the new configuration by checking the HP Summary Screen. Refer to page 44.

Installing Accessory Boards

CAUTION

Static electricity can damage electronic components. Turn all equipment off. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the computer while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

The PC has four main accessory board slots and one supplementary ISA slot:

- Slot 1 (the top slot) can be used for a full-length 32-bit PCI board
- Slot 2 can be used for either a full-length 32-bit PCI or a full-length 16-bit ISA board
- Slot 3 can be used for a full-length 32-bit PCI board
- Slot 4 (the bottom slot) can be used either a full-length 32-bit PCI or a $\frac{3}{4}$ -length 16-bit ISA board.
- Slot 5 (the supplementary slot) is under the power supply and can be used for half-length 16-bit ISA boards (16 cm/6.3-inch maximum length). Alternatively, this space can be used for a hard disk drive (refer to page 29).

Configuring Accessory Boards with Plug and Play

Plug and Play is an industry standard for automatically configuring your PC's hardware resources and the accessory boards installed in it. Your PC has configurable support for Plug and Play in the BIOS.

All PCI accessory boards are Plug and Play, although not all ISA boards are. Check the accessory board's documentation if you are unsure.

When you start your PC after installing an accessory board, the Plug and Play BIOS automatically detects which hardware resources (IRQs, DMAs, memory ranges, and I/O addresses) are used by the system-based components.

2 How to Install Accessories In Your PC

Installing Accessory Boards

Configuring non-Plug and Play ISA Accessory Boards

If you install an ISA accessory board that is not Plug and Play you will need to configure the board before your PC can use it.

Refer to the documentation supplied with the operating system for details on your operating system's capabilities and restrictions concerning how to configure non-Plug and Play accessory boards.

Installing the Board

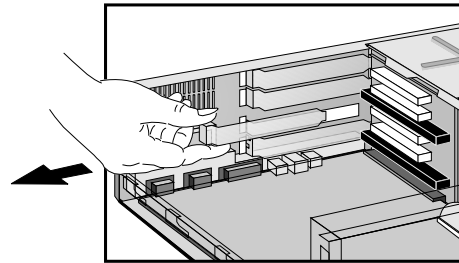
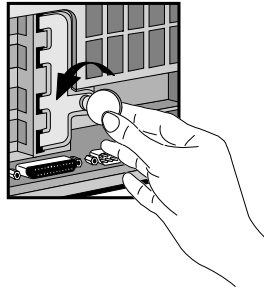
- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 At the rear of the PC, unscrew the retaining bracket (you can use a coin to do this) and remove it. (See diagram on facing page.)
- 4 Find a free slot. Some boards may have preferred locations and special installation instructions detailed in their manuals.
- 5 Remove the slot cover. Store it in a safe place.
- 6 Hold the board horizontally by its "top" edge. Slide it into the board guide of the chosen slot. Do not bend the board. (See diagram on facing page.)
- 7 Align the board's connector with the slot's socket and firmly press into the socket. Ensure the board's connector engages completely with the socket and does not touch components on other boards.
- 8 Secure the board by replacing the retaining bracket at the rear of the PC. Ensure that all accessory boards and slot covers are correctly aligned and firmly secured by the bracket.
- 9 If you have installed a VESA-standard graphics adapter board, connect the accessory board's cable to the VESA pass-through connector that is either on the system board (for integrated video models) or on the Millennium graphics board (refer to page 25).
- 10 Install any other accessories before replacing the cover. Reconnect all cables and power cords.

2 How to Install Accessories In Your PC

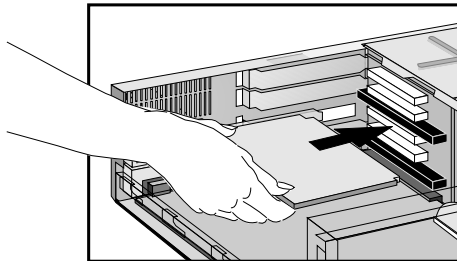
Installing Accessory Boards

Installing an Accessory Board (refer to previous page)

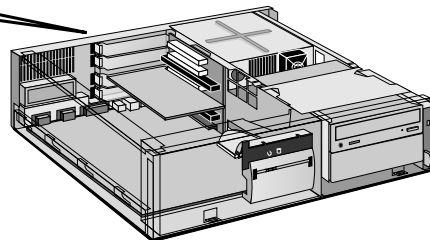
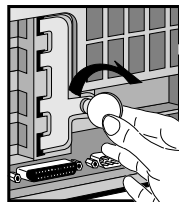
Step 3: Unscrew the retaining bracket.



Step 5: Remove slot cover.



Step 7: Slide board into the slot.



Step 8: Replace the retaining bracket.
(Ensure boards are correctly aligned.)

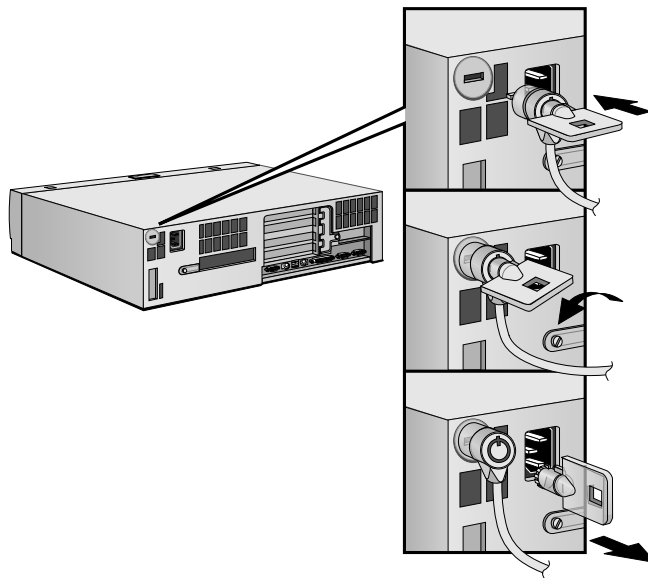
2 How to Install Accessories In Your PC

Installing a Security Cable

Installing a Security Cable

You can secure the PC to your desk, or any other fixed object, using a Kensington security cable. The PC has a slot at the rear for securing the cable.

- 1 Insert the lock into the slot located at the rear of the PC.
- 2 Turn the key to lock the cable to the PC.
- 3 Remove the key and store it in a safe place.



NOTE

The Kensington security cable is not an HP accessory. It cannot be ordered from HP. Contact your reseller for more information.

Troubleshooting Your PC

This chapter can help you solve problems that you may encounter when using your PC.

3 Troubleshooting Your PC

Solving Problems

Solving Problems

This chapter can help you solve most problems you might have with your PC.

If you are unable to solve your problem after following the advice in this chapter, refer to "Hewlett Packard Support and Information Services", on page 67.

HP Summary Screen

The HP Summary Screen provides information about your PC's current configuration. To view the Summary Screen, press **Esc** just after your PC is switched on and while the Vectra Logo appears during the Power-on-Self-Test (POST). Refer to "HP Setup Program", on page 66.

If Your PC Does Not Start Properly

Use this section if your PC does not start properly when you turn it on, and you experience one of the following symptoms:

- Your PC's display is blank and there are no error messages.
- You cannot start your PC from a modem.
- A POST error message is displayed.

Display is Blank and There Are No Error Messages

If your display is blank and there are no error messages when you turn on your PC, follow this procedure:

- 1 Check external items.
- 2 Check internal items.
- 3 Rebuild your PC's components.

Check External Items	<p>Be sure the following external items are functioning properly:</p> <ul style="list-style-type: none">• Check that the computer and display are turned on. (The power light should be illuminated.)• Check the display's contrast and brightness settings.• Make sure that all cables and power cords are connected and firmly plugged in.• Make sure the power outlet is working.• If pressing the space bar does not start the PC, ensure that this feature is enabled in the <i>Setup</i> program and that the system board switch 8 is CLOSED (refer to page 62).
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3 Troubleshooting Your PC

If Your PC Does Not Start Properly

Check Internal Items

If the PC still does not start properly, follow this procedure to check the internal items:

- 1 Turn off the display, the computer, and all external devices.
- 2 Unplug all power cords and cables, noting their positions. Disconnect the PC from any telecommunications network.
- 3 Remove the cover.
- 4 Check the following items:

Action	Reference
Check all internal cables.	Ensure they are correctly attached and firmly in place.
Check that the processor speed switches have been set correctly.	Refer to "System Board Switches" on page 62.
Check that the memory modules are correctly installed.	Refer to "Installing Memory" on page 23.
Check that accessory boards are firmly seated in their slots.	Refer to "Installing Accessory Boards" on page 39.
Verify that any switches and jumpers on the accessory boards are properly set.	Refer to the manuals that came with each board.
Check that the switches on the system board are properly set.	Refer to "System Board Switches" on page 62.

- 5 Replace the cover.
- 6 Reconnect all cables and power cords.
- 7 Turn on the display and computer.

Rebuild Your PC's Components

If your PC still does not start properly, remove all accessory boards and other accessories, except the hard disk drive. Start the PC. If the PC now works, add the boards and accessories one at a time to determine which one is causing the problem.

If You Cannot Start Your PC from a Modem

If you are running Windows 95 and you have chosen the option to start your PC from a modem, and this option does not work, then you need to change the IRQ setting in the HP *Setup* program.

In the Setup program, go to the Security group, and the “Start-up Center” submenu. Change the IRQ setting for the setup item “Start from Modem”. (Refer to "HP Setup Program", on page 66.)

If a POST Error Message is Displayed

The Power-On-Self-Test (POST) can detect both an error and a change to the configuration. In either case, a code and short description is displayed. Depending on the message, you will have one or more of these choices available on screen:

- Press **(F1)** to ignore the message and continue.
- Press **(F2)** to run *Setup* and correct a system configuration *error*. HP recommends that you correct the error before proceeding, even if the PC appears to start successfully.
- Press **(F4)** to accept (validate) the change and update *Setup*'s configuration information.
- Press **(↵ Enter)** to see more details about the message. After viewing these details, you will be returned to the original POST display screen. If the message is actually a change to the configuration you have made (for example, you have just removed some memory), you can then press **(F4)** to accept the change and update *Setup*'s configuration information. Otherwise, press **(F1)** to ignore the message and continue, or press **(F2)** to run *Setup* and correct a system configuration *error*. (The number of choices you will have available are dependent on the kind of error.)

3 Troubleshooting Your PC

If Your PC Does Not Start Properly

Clearing the PC's Configuration Memory

If the PC then starts, but POST still persists in reporting an error, clear the current configuration memory values and reinstall the built-in default values:

- 1 Turn off the PC, disconnect the power and all cables, and remove the cover.
 - a Set the system board switch 6 (CMOS STATUS) to CLOSED to clear the configuration.
 - b Replace the cover, and reconnect the power cable only.
 - c Turn on the PC. This will erase the CMOS memory.
 - d Wait until the PC has started. A message will be displayed similar to this:

```
"Configuration has been cleared, set switch 6 to the OPEN position before rebooting."
```


Turn off the PC, disconnect the power cable, and remove the cover.
 - e Set the system board switch 6 (CMOS STATUS) on the switch block to OPEN to re-enable the configuration.
- 2 Replace the cover, and reconnect the power and cables.
- 3 Switch on the PC. An error message will be displayed:

```
"Incorrect PC configuration"
```


The PC will stop. Press any key to continue. A "pop-up" screen will appear stating that the:

```
CMOS checksum is invalid.  
Default values will be loaded.  
Press any key to continue.
```
- 4 Run *Setup* by pressing **(F2)**. CMOS default values will be automatically downloaded and saved.
- 5 Make any other changes you want and press **(F3)** to save the configuration and exit from *Setup*.

If You Cannot Turn Off Your PC

Use this section if you cannot turn off your PC, the power indication light is red, and you hear a “buzzing” sound.

- Check if your PC is locked, whereby “power-off” is not allowed. You will need to enter a password to unlock the PC (refer to "Power-On Password", in the HP Setup program —refer to "HP Setup Program", on page 66—and to "Setting Passwords", on page 14).
- Check if you are in a suspend/sleep mode, where by a “power-off” would risk a loss of information/data (refer to "Power Menu Items", in the HP Setup program —refer to "HP Setup Program", on page 66). Wake up the PC first and then shut it down.

If Your PC Has a Hardware Problem

This section describes what to do if you have problems with your display, disk drives, printer, accessory board, keyboard, or mouse.

Display Does Not Work Properly

If Your Display is Blurred or Unreadable

If you have selected the wrong display, the display screen may become blurred or unreadable. To correct this problem:

- Select the correct display by referring to the display options section in the HP-provided online user setup information that came with your PC.
- Alternatively, select the correct display by using the procedures in the operating system on your PC. Refer to your PC’s operating system documentation for details.

3 Troubleshooting Your PC

If Your PC Has a Hardware Problem

If Nothing is Displayed on the Screen

If the display works correctly during the Power-On-Self-Test (POST), but goes blank when Windows starts:

- Check that you have enough memory for the video mode you have selected.
- If your screen's refresh rate is set too high, the screen might be blank. If you have Windows NT 4.0, you can start Windows in "safe mode" which will allow you to change the display settings. To learn how to start Windows in "safe mode", refer to the operating system documentation.
 - a If your display is DDC compliant, ensure that **Video Plug & Play display** is enabled. This field is in the **Video** section of the **Configuration** menu.
 - b If your display is not DDC compliant, **Video Plug & Play display** must be disabled. This field is in the **Video** section of the **Configuration** menu. Also, check the refresh settings in the **Video** section to ensure they are not too high.

To know if your display is DDC compliant, refer to the display documentation.

If nothing is displayed on the screen at all, but the PC starts and the keyboard, disk drives, and other peripheral devices seem to operate properly:

- Make sure that the display is plugged in and switched ON.
- Check that you have entered a password if you have set the keyboard and mouse to "locked". You can change this setting in the *Setup* program. Refer to "Security Menu Items" (refer to "HP Setup Program", on page 66).
- Check that the brightness and contrast controls are properly set.
- Ensure that the display video cable is correctly connected.
- Switch off the display, and unplug it from the power outlet. Disconnect the video cable and examine the video cable connector pins. If the pins are bent, carefully straighten them.
- Check that the video upgrade is properly installed if you have one.
- Check that an accessory board doesn't use the same I/O address as the integrated video interface (03B0h to 03DFh). Refer to the manual supplied with the accessory for further information.

Other Display Problems

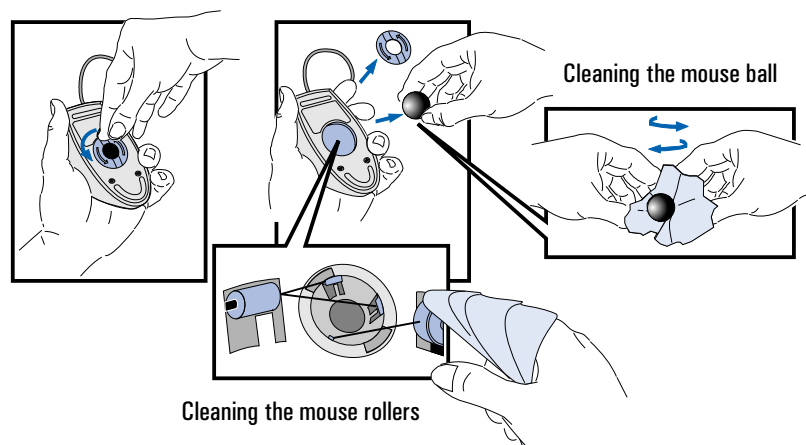
If the display image is not aligned with the screen, use the display's controls to center the image (refer to the display manual for instructions). If the screens generated by the applications do not appear to be correct, check the application's manual to find out which video standard is required. Also check your display manual to find out which refresh rate is required. Use *Setup*, or your operating system's procedures, to select the correct refresh rate.

If Your Keyboard Does Not Work

- Ensure that the keyboard is correctly connected.
- If you turn on your PC, the operating system boots, the keyboard is correctly connected, but your keyboard is still not available, the power-on password may be set to "keyboard locked". You will need to enter a password to unlock the keyboard (and mouse). You can change this setting in the *Setup* program. Refer to "Security Menu Items" (refer to "HP Setup Program", on page 66).

If Your Mouse Does Not Work

- Ensure that the mouse is correctly connected.
- Ensure that the mouse driver supplied with the preloaded software is installed correctly. (Choose a Logitech® mouse driver.)
- Clean the mouse ball and rollers as shown in the figure below (use a non-residual contact cleaner).



3 Troubleshooting Your PC

If Your PC Has a Hardware Problem

If Your Printer Does Not Work

- Make sure that the printer is configured correctly for the PC and for the application.
 - c Ensure the PC's port has been correctly configured using *Setup*.
 - d Make sure the printer is correctly set up in your operating system's configuration.
 - e Ensure the application program's "print" menu has been correctly set up. (Refer to the manual supplied with the application software.)
- Check that the PC's port is working properly by running another peripheral connected to the port.
- Refer to the printer's manual for further help.

If the Flexible Disk Drive Does Not Work

- Ensure you are using a formatted diskette and it is inserted correctly.
- Check you are using a diskette that is the right density.
- Check that your flexible disk drive is correctly configured in the *Setup* **Configuration** menu.
- Check the option on the *Setup* **Configuration** menu which enables or disables the on-board flexible disk controller.
- Clean the flexible disk drive using a diskette cleaning kit.
- Check that the flexible disk drive has been enabled in *Setup*.
 - Flexible disk drive (refer to "Hardware Protection Submenu (Security group)" in the HP Setup program—see "HP Setup Program", on page 66)
 - Boot on flexible disk drive (refer to "Start-up Center Submenu (Security group)" in the HP Setup program—see "HP Setup Program", on page 66)
 - Write on flexible disk drives (refer to "Start-up Center Submenu (Security group)" in the HP Setup program—see "HP Setup Program", on page 66)
- Check that the disk power and data cables are correctly connected.

If the Hard Disk Does Not Work

- Check that the disk power and data cables are correctly connected (refer to "Connecting IDE Devices", on page 27).
- Check that the hard disk drive has been "enabled" (refer to "Hardware Protection Submenu (Security group) in the HP Setup program—see "HP Setup Program", on page 66). There is also an option in the *Setup* program that lets you disable or enable boot on hard disk drive (refer to "Start-up Center Submenu (Security group)" in the HP Setup program—see "HP Setup Program", on page 66).
- Check that the hard disk drive has been detected (refer to "IDE Devices Submenu (Configuration group)" in the HP Setup program—see "HP Setup Program", on page 66).
- Check that the on-board Bus IDE is enabled if you are using the integrated IDE controller (refer to "IDE Devices Submenu (Configuration group)" in the HP Setup program—see "HP Setup Program", on page 66).

If the Hard Disk Activity Light Does Not Work

If the hard disk activity light does not flicker when the PC is accessing the hard disk drive:

- Check that the control panel connector is firmly attached to the system board.
- Check that the disk power and data cables are correctly connected.

NOTE

If you are using a hard disk drive with a controller board (a SCSI hard disk, for example), the activity light does **not** flicker when the PC is accessing the hard disk drive

3 Troubleshooting Your PC

If Your PC Has a Hardware Problem

If the CD-ROM Drive Has a Problem

WARNING

Be sure to disconnect the power cord and any telecommunication cables from your computer before you remove the cover to check the cable connections or jumper settings.

To avoid electric shock and harm to your eyes by laser light, do not open the CD-ROM drive enclosure. The CD-ROM drive should be serviced by service personnel only. Refer to the label on the CD-ROM for power requirements and wavelength. This PC is a class 1 laser product. Do not attempt to make any adjustment of the laser unit.

CD-ROM Drive Does Not Work

- Check that the cables have been properly connected.
- Check that a CD is inserted in the drive.
- Verify that the CD-ROM is declared as “CD” in the *Setup* program (refer to "IDE Devices Submenu (Configuration group)" in the HP Setup program—see "HP Setup Program", on page 66).
- Verify that the **Bus IDE Adapters** item is set to **Both** in *Setup* (refer to "IDE Devices Submenu (Configuration group)" in the HP Setup program—see "HP Setup Program", on page 66).
- If you intend to boot on CD-ROM, make sure that this option is enabled in *Setup* (refer to "Start-up Center Submenu (Security group)" in the HP Setup program—see "HP Setup Program", on page 66).
- For further information refer to the CD-ROM documentation.

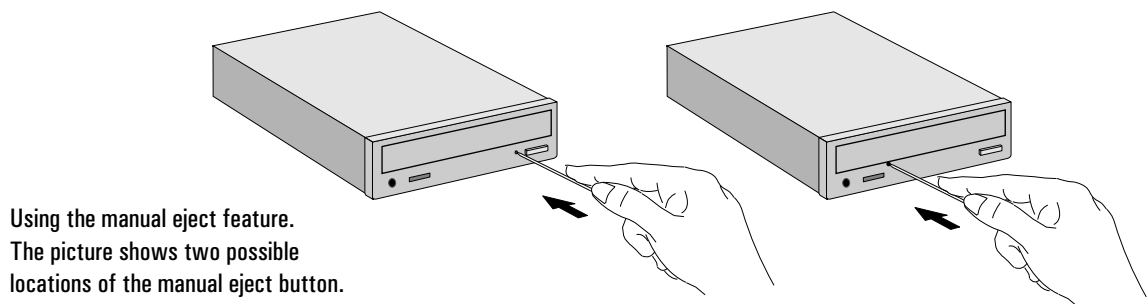
CD-ROM Drive is Idle

If the CD-ROM drive does not appear to be working, try accessing the disk by clicking on the CD-ROM drive icon or drive letter assigned to the CD-ROM drive by your operating system.

CD-ROM Drive Door Does Not Open

If you have difficulty removing a CD-ROM disk from the CD-ROM drive (during a power failure for example), you can use the manual eject button. To eject a CD-ROM disk using the manual eject button, do the following:

- 1 If the CD-ROM drive manual eject button is not visible, remove the front bezel covering the CD-ROM drive. The manual eject button is inside a small hole on the front of the CD-ROM drive.
- 2 With a thin, solid rod, such as the end of a paper clip, push the CD-ROM's manual eject button.



- 3 The CD-ROM drive door will be released, opening slightly. Carefully pull it open fully and retrieve the disk.
- 4 To close the CD-ROM drive door, push it gently closed without forcing it. The CD-ROM drive door may not close completely until it is fully functional (for example, when the power comes back on).
- 5 If required, replace the CD-ROM drive's front bezel.

If an Accessory Board Does Not Work

Carry out the following checks:

- Ensure the board has been firmly installed in the slot.
- Check that the accessory board has been correctly configured.
- Ensure the board is not using memory, I/O addresses, an IRQ, or DMA also used by the PC. Refer to "IRQs, DMAs, and I/O Addresses Used by Your PC", on page 65. Refer to the board's manual for further details.

3 Troubleshooting Your PC

If You Have Forgotten Your Password

If You Have Forgotten Your Password

- ☐ If you forget the User password, but not the Administrator password, carry out the following procedure:
 - 1 Switch off the PC.
 - 2 Restart the PC. If the keyboard is locked, enter the Administrator password.
 - 3 Wait for **F2=Setup** to be displayed.
 - 4 Press **(F2)** to start *Setup*.
 - 5 Enter the Administrator password to access the *Setup* program.
 - 6 Select the **User Password** section in the **Security** menu, then select **Set User Password**.
 - 7 When asked for the old User password, enter the Administrator password.
 - 8 Set a new User password. This will replace the old password that you had forgotten.
 - 9 Press **(F3)** to save the new password and exit *Setup*.
- ☐ If you forget both the User password and Administrator password:
 - 1 Switch off the PC.
 - 2 Remove the computer's cover.
 - 3 Set switch 7 on the system board switch block to CLOSED (refer to "System Board Switches", on page 62).
 - 4 Switch on the PC and allow it to complete its startup routine.
The message "Passwords have been cleared, power-off your PC and set switch 7 to open position before restarting" will be displayed.
 - 5 Switch off the computer.
 - 6 Reset switch 7 to OPEN.
 - 7 Replace the computer's cover.
 - 8 Switch on the PC and allow it to complete its startup routine.
 - 9 After the Power-On Self-Test has completed, press **(F2)** when prompted to use *Setup*.
 - 10 Set new User and System Administrator passwords.
 - 11 Press **(F3)** to save the new passwords and exit *Setup*.

If Your PC Has a Software Problem

If Your Application Software Does Not Work

If the PC reports the system is OK and the indicator light over the power switch is illuminated, but some software won't run:

- Refer to the operating system and application software manuals.
- If Windows does not run properly, refer to the Windows manual for guidance.

If the Date and Time are Incorrect

The date and time can be incorrect for the following reasons:

- the time has changed for the seasons
- the PC has been unplugged from the power too long, and the battery is discharged.

To change the date and time, use your operating system utilities or the *Setup* program.

3 Troubleshooting Your PC

If Your PC Has an Audio Problem

If Your PC Has an Audio Problem

No Sound When Running Any Applications

First, check that the output volume is not set to zero. Use the volume control on the front panel. Make sure the headphones are not connected directly to the CD-ROM drive (see the connection information in chapter 1).

If you are using Windows NT 4.0, check the volume, mute, and balance settings. Refer to the operating system documentation for more information.

Remember also that plugging the headphones into the front panel cuts out sound to the internal speaker and to external speakers connected to the audio Stereo Out jack.

When your PC starts up, the integrated audio interface may have no IRQ or DMA settings. These settings are initialized by software upon startup. Your system files may not have the necessary entries. Run the Setup program to configure the IRQ and DMA settings.

Absence of sound can also be caused by a hardware conflict. Hardware conflicts occur when two or more peripheral devices compete for the same signal lines or channels. Conflicts between your audio interface and another peripheral device might be due to the settings of the I/O addresses, IRQ channel, or DMA channel. To resolve the conflict, change the settings either of the audio interface or of any other ISA accessory in your system.

No Output from the 8- bit or 16-bit Digitized Sounds

This might be due to the DMA channel selected. If you hear no output from both the 8-bit and 16-bit digitized sounds, this might be due to an interrupt conflict. Use the HP Setup program or your operating system's audio control software to change the audio interface's DMA channel or IRQ setting.

The Volume is Too Low

The computer has two output jacks, Stereo Out on the rear of the computer and a headphones jack on the front panel, which provide the same output signal. This is a low-distortion output that cannot drive (without amplification) low-impedance devices such as speakers. If you plug devices with a low-impedance (less than 32 ohms) into the Stereo Out jack or the headphones jack, the volume will be low.

Audio Input from the Microphone is Too Low, or No Audio At All	Check that the microphone specifications meet the requirements of the 16-bit sound components. The microphone should be a 600-ohm dynamic type.
Humming Noise	If the power grounding of your audio components is inadequate, a humming noise may be generated. This may happen if your PC is connected to a hifi system. Plug all devices into adjacent power outlets (outlets within 5 cm / 2 inches of each other), or use line filters.
Occasional Crackles When Playing Back Sounds	These crackles are usually the result of your PC being unable to transfer audio samples within the required time. A solution is to use a lower sampling rate. Recording and playing back at 22 kHz is less demanding upon system resources than recording audio at 44 kHz.
The PC Hangs While Recording	<p>Uncompressed digital audio can eventually fill your hard disk. For example, one minute of stereo sound recorded at a resolution of 44 kHz will occupy about 10.5 MB. Before recording, check that there is enough free space on your hard disk.</p> <p>Data compression can reduce the space required. The A-law and μ-law hardware compression used by the audio interface enables the sampling of sound at a resolution of 16-bits, but it generates the same quantity of data as an 8-bit sample.</p>
MS-DOS Games Give "Not enough memory" Errors	Many games require a large amount of base memory and may not execute if many drivers or TSR (Terminate and Stay Resident) programs are installed. You may solve this problem by loading device drivers and TSRs into high memory. Refer to your MS-DOS manual for details of how to do this.

Changing the Battery

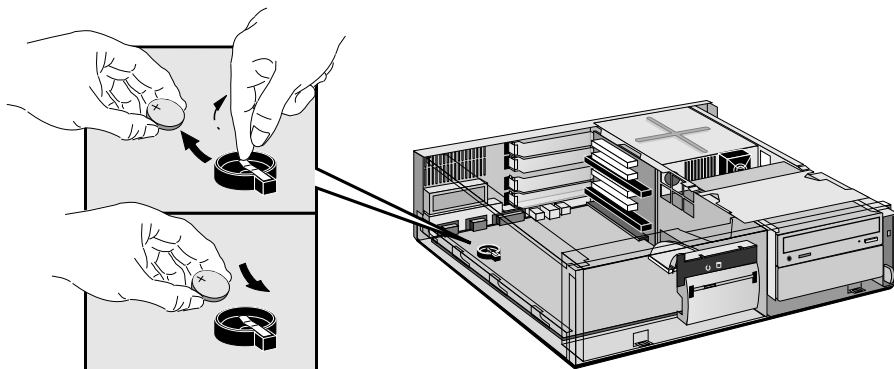
WARNING

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery in this PC is a lithium battery which does not contain heavy metals, nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, or to the dealer from whom you purchased your PC, or to HP, so that they can either be recycled or disposed of in an environmentally sound way. Returned used batteries will be accepted free of charge.

You should order replacement battery HP 1420-0356 from your local Sales and Service office, or a “CR2032 type” battery, which is available from most local stores.

After removing the computer's cover:

- 1 Remove the old battery by sliding it from under the retaining clip (note the position of the cross).

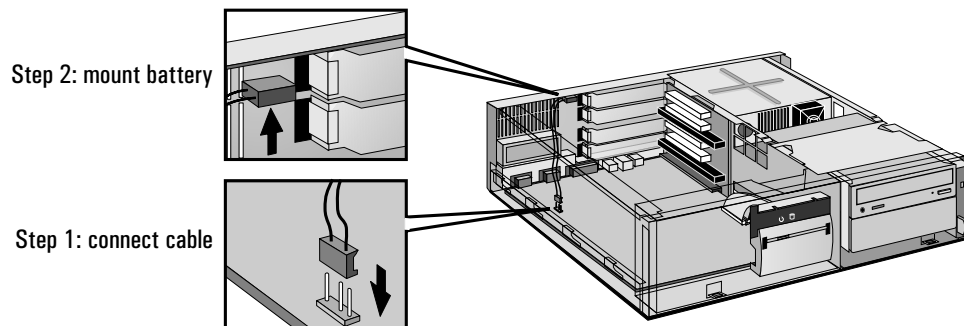


- 2 Place the new battery in the battery holder, with the cross in the same position as the old battery, and ensure that it is properly seated. Ensure that the clip is in place and holds the battery firmly.

External Battery

You can also install an external battery in the PC, which you can order from your authorized reseller. Install the external battery as follows:

- 1 After removing the computer's cover, connect the external battery cable to the battery connector on the system board.
- 2 Mount the external battery as shown below, using the self-adhesive strip supplied.



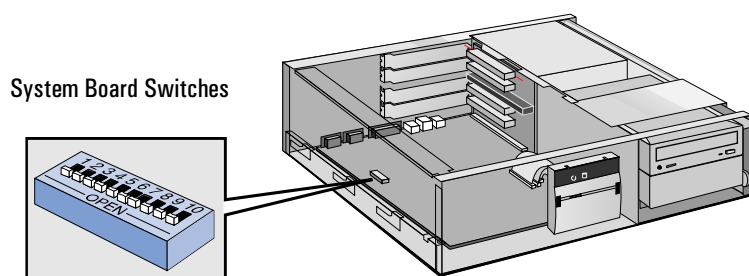
After installing either a replacement or an external battery, replace the computer's cover and run the *Setup* program to reconfigure the computer.

3 Troubleshooting Your PC

Technical Information

Technical Information

System Board Switches



Switch	Switch function:
1 - 5	Processor speed, see next table
6	CMOS: Open = normal (default) Closed = clear CMOS and reload default values in <i>Setup</i>
7	Password: Open = enabled (default) Closed = disabled / clear User and Administrator passwords
8	Keyboard power-on: Open = disabled Closed = enabled (default)
9, 10	Reserved – Do not use

Processor Frequency	Bus Frequency	Switch1	Switch 2	Switch 3	Switch 4	Switch 5
200	66 MHz	Open	Open	Open	Closed	Open
233	66 MHz	Open	Open	Open	Closed	Closed
266	66 MHz	Open	Open	Closed	Open	Open
300 ¹	66 MHz	Open	Open	Closed	Open	Closed
333 ¹	66 MHz	Open	Open	Closed	Closed	Open

1. Switch settings if these processor frequencies become available.

Power Consumption

Power Consumption (Windows NT)	115V / 60Hz	230V / 50Hz
Operating with input/output	≤ 63 W	≤ 65 W
Operating without input/output	≤ 31 W	≤ 34 W
Standby	≤ 30 W	≤ 30 W
Off	≤ 1.2 W	≤ 2.8 W

NOTE

When the PC is turned off with the power button on the front panel, the power consumption falls below 5 Watts, but is not zero. The special on/off method used by this PC considerably extends the lifetime of the power supply. To reach zero power consumption in “off” mode, either unplug the PC from the power outlet or use a power block with a switch.

Typical Power Consumption/Availability for ISA Accessory Slots

+ 5 V	4.5A limit per slot (limited by system board)
+ 12 V	1.5A limit per slot (limited by system board)
-5 V	0.1A total power limit (limited by power supply)
-12 V	0.3A total power limit (limited by power supply)

Typical Power Consumption/Availability for PCI Accessory Slots

+ 5 V	4.5A maximum per slot
+ 12 V	0.5A maximum per slot
-12 V	0.1A maximum per slot

There is a maximum per-slot limit of 25 W between all supply rails.

Acoustic Noise Emission

Acoustic Noise Emission	Sound Power	Sound Pressure
Operating	LwA ≤ 39 dB	LpA ≤ 34 dB
Operating with HDD access	LwA ≤ 41 dB	LpA ≤ 35 dB
Operating with FDD access	LwA ≤ 43 dB	LpA ≤ 37 dB

3 Troubleshooting Your PC

Technical Information

Physical Characteristics

Characteristic	Description
Weight (excluding display and keyboard)	9 kg (20 pounds)
Dimensions	Width: 43.5 cm (17.1 inches) Height: 13.2 cm (5.2 inches) Depth: 44.6 cm (17.5 inches)
Footprint	0.194 m ² (2.08 ft ²)
Storage temperature	–40 °C to 70° (–40 °F to 158 °F)
Storage humidity	8% to 80% (relative), non-condensing at 40°C (104 °F)
Operating temperature	10 °C to 40°C (50 °F to 104 °F)
Operating humidity	15% to 80% (relative)
Power supply	Input voltage: 100 – 127, 200 – 240V ac Input frequency: 50/60 Hz Maximum output power: 120W continuous

IRQs, DMAs, and I/O Addresses Used by Your PC

<p>IRQs used by PC</p> <p>The IRQ, DMA, and I/O address mappings shown here are for a PC with a basic configuration. The resources used by your PC may vary, depending upon which accessory boards are bundled with the PC.</p>	<p>IRQ0 system timer</p> <p>IRQ1 keyboard</p> <p>IRQ2 system cascade</p> <p>IRQ3 free if not used for serial port</p> <p>IRQ4 free if not used for serial port</p> <p>IRQ5 free if not used for parallel port</p> <p>IRQ6 flexible disk drive controller</p> <p>IRQ7 free if not used for parallel port</p> <p>IRQ8 real-time clock</p> <p>IRQ9 available for PCI devices, if not used by ISA board</p> <p>IRQ10 available for PCI devices, if not used by ISA board</p> <p>IRQ11 available for PCI devices, if not used by ISA board</p> <p>IRQ12 mouse</p> <p>IRQ13 co-processor</p> <p>IRQ14 integrated IDE hard disk drive controller</p> <p>IRQ15 free if not used by second IDE controller</p>
<p>DMAs used by PC</p>	<p>DMA 0 free</p> <p>DMA 1 free if not used for parallel port in <i>Setup</i></p> <p>DMA 2 flexible disk drive controller</p> <p>DMA 3 free if not used for parallel port in <i>Setup</i></p> <p>DMA 4 used to cascade DMA channels 0-3</p> <p>DMA 5 free</p> <p>DMA 6 free</p> <p>DMA 7 free</p>
<p>I/O Addresses used by PC</p>	<p>170h - 177h, 376h IDE secondary channel</p> <p>1F0h - 1F7h, 3F6h IDE primary channel</p> <p>278h - 27Fh (and 3A8h) parallel port</p> <p>2E8h - 2EFh serial port</p> <p>2F8h - 2FFh serial port</p> <p>370h - 371h integrated I/O controller</p> <p>378h - 37Fh parallel port</p> <p>3B0h - 3DFh (3B0-3BB,300-3DF) integrated video graphics controller</p> <p>3E8h - 3EFh serial port</p> <p>3F0h - 3F5h, 3F7h integrated flexible disk controller</p> <p>3F8h - 3FFh serial port</p> <p>496h - 497h HP reserved</p> <p>678h - 67Bh parallel port if ECP mode is selected</p> <p>778h - 77Bh parallel port if ECP mode is selected</p>

3 Troubleshooting Your PC

HP Setup Program

HP Setup Program

Check your PC's configuration when you first use the PC and each time after you install, remove, or upgrade accessories. Follow these instructions:

- | | |
|-----------------------------------|---|
| First, Turn Off Your PC | Turn on the display and then the PC. If the PC is already turned on, save your data and exit all programs. For Windows NT 4.0 and Windows 95, use the Shut Down command. |
| To Go to the HP Summary Screen | While the <i>Vectra</i> logo appears on your display, press Esc . This will take you to the HP Summary Screen. The Summary Screen will appear for only a short time. To retain the screen indefinitely (until you decide to leave it), press F5 . |
| To Go to the <i>Setup</i> Program | To go immediately into the <i>Setup</i> program while the <i>Vectra</i> logo appears on your display (and bypass the Summary Screen), press F2 instead of Esc . |

Hewlett Packard Support and
Information Services

Introduction

Hewlett Packard computers are engineered for quality and reliability to give you many years of trouble-free service. To ensure that your desktop system maintains its reliability and to keep you up-to-date with the latest developments, HP and a worldwide network of trained and authorized resellers provide a comprehensive range of service and support options which are listed below:

- HP Authorized Reseller
- HP SupportPack
- HP Support Assistant CD-ROM
- HP Information Services

Service	Means of Access
HP Forum on CompuServe	Modem
HP Forum on America Online (US only)	Modem
HP BBS Library	Modem
HP World Wide Web Site	World Wide Web Access
HP FIRST Faxback	Phone and Fax
Audio Tips (US only)	Phone
HP Drivers/BIOS diskettes	Delivered by mail

- HP Support Services
 - Technical phone support
 - Lifeline phone support
 - Network phone-in support.

NOTE

When calling any of the international telephone numbers listed in this chapter, replace the '+' with your international telephone access code.

Your HP Authorized Reseller

HP Authorized Resellers have been trained on HP Vectra equipment and are familiar with its configuration and environment. Authorized Resellers can also answer questions regarding non-HP hardware, software and systems as well as answer queries about usage not intended for, or not commonly used with the HP Vectra.

Authorized HP Resellers can also offer consulting services tailored to your specific needs regarding product development or custom installations, as will third party support services, or the HP Customer Support organization in your country.

HP SupportPack

HP's three-year SupportPack is available from your local reseller. It must be purchased within 30 days of purchasing your HP Vectra.

The concept of SupportPack is simple. It allows you to extend your one-year on-site hardware warranty to a three-year on-site hardware warranty, offering next day on-site response.

SupportPack is valid for the piece of equipment for which it was bought, but is not transferable from one piece of equipment to another.

HP Support Assistant CD-ROM

HP Support Assistant is a yearly subscription service on two CD-ROMs: one for software; and another one for support documentation.

The software CD-ROM is updated monthly and contains the latest HP drivers and utilities. The documentation CD-ROM is updated quarterly and contains:

- Product manuals and service manuals
- Installation and configuration information
- Troubleshooting information
- Technical reference manuals.

Subscriptions to HP Support Assistant can be obtained with an order form which is available from the HP FIRST Faxback system. Request document number 9025 (US and Asia Pacific) or 19025 (Europe). Subscriptions can also be obtained by contacting the following numbers:

Region	Phone Number	Fax Number
Asia-Pacific	+ 65 740-4477	+ 65 740-4499
Europe	+ 31 (55) 384279	+ 31 (55) 434455
Latin America	+ 1 (317) 364-8882	+ 1 (317) 364-8888
US/Canada	1 (800) 457-1762	+ 1 (317) 364-8888

Hewlett-Packard Information Services

Hewlett Packard Electronic Information Services are available 24 hours per day, 7 days per week, ensuring that the most up-to-date information is always available.

HP Forum on CompuServe

The HP Systems Forum on CompuServe is an on-line service, accessible via modem. This service provides information about your HP PC, and allows you to communicate with other HP users through an on-line user forum. HP users share their knowledge and experience with you, and you will be able to ask, or answer, technical questions about your HP Vectra PC, and HP products.

You can also download the latest versions of drivers, BIOS and software utilities for HP Vectra PCs.

As a preferred Hewlett Packard customer, you are invited to join CompuServe at no initial charge.

For the United States and the United Kingdom, call the number shown below and ask for representative 51. For all other locations, first call the worldwide number to obtain the number of your local sales office, then call your local sales office and ask for representative 51.

Country	Local Call / Freephone Number	Direct Number
United States	1 (800) 848-8199	+ 1 (614) 529-1349
United Kingdom	(0800) 289378	+ 44 (1272) 760680
Worldwide	—	+ 1 (614) 529-1349

CompuServe will send you a free introductory membership immediately, including information on how to access CompuServe.

At the CompuServe ! prompt, type **GO HP**.


4 Hewlett Packard Support and Information Services

Hewlett-Packard Information Services

HP Forum on America Online

The HP Forum on America Online is an electronic information and communication service which can be accessed via modem.

To access the HP Forum:

- select **Keyword Search** from the menu,
- type **HP**,
- press .

This will load the HP Home Page directly onto your screen.

In the HP Forum you can ask and answer questions about HP products and you can also download drivers, software application notes, or utilities for HP products.

Membership information can be obtained by calling 1(800) 827-6364, giving the preferred customer number 1118.

4 Hewlett Packard Support and Information Services

Hewlett-Packard Information Services

HP BBS Library

The HP electronic bulletin board library service contains the latest versions of drivers, BIOS, and utilities, which you can download to your PC using a modem. Support documentation is also available.

Country	Number	Baud Rate
United States	+1 (208) 344-1691	300, 1200, 2400, 4800, 9600, 14400
United Kingdom	+44 (1344) 3600880	up to 14400
Worldwide	+1 (208) 344-1691	300, 1200, 2400, 4800, 9600, 14400

Set your modem for no parity, 8 data bits, and 1 stop bit (N, 8, 1).

HP World Wide Web Site

The HP World Wide Web site gives you access to information about HP, its products, including product data sheets, service and support information, electronic newsletters and technical tips. You can also download the latest versions of drivers, BIOS and software utilities.

The Access Guide Directory guides you through the information and services available.

World-Wide Web URL

<http://www.hp.com>

4 Hewlett Packard Support and Information Services

Hewlett-Packard Information Services

HP FAXback on Demand—HP FIRST

HP FIRST is a service where you can select documents, support and technical information, data sheets and pre-sales information, which are then faxed to you. To access this service, you can use a touch-tone phone and have the fax sent to the fax machine of your choice, or use the handset on your fax machine and dial one of the numbers given below:

Country/Region	Number	Access Method
United States	1 (800) 333-1917	Phone or fax
U.K.	(0800) 960271	Phone or fax
Australia	+ 61 (3) 9272-2627	Phone or fax
Singapore	+ 65 291-7951	Phone or fax
Hong Kong	+ 852 2506-2422	Phone or fax
New Zealand	+ 64 (9) 356-6642	Phone or fax
Europe	+ 31 (20) 681-5792	Phone or fax
Worldwide	+ 1 (208) 344-4809	Fax

A complete description of Hewlett-Packard electronic services is provided in document #9020.

HP Audio Tips (USA only) HP Automated Support Directory

HP Audio Tips is an automated system containing recordings which can direct you to Hewlett Packard support services. Live support is not available through this service.

Dial 1 (800) 333-1917 and press 3, to access HP Audio Tips.

Ordering Drivers and BIOS on Diskette

You can order diskettes from HP, with the latest versions of drivers, BIOS and software utilities. The diskettes will be delivered by mail.

Information for ordering diskettes is set out in the table below:

North and Latin America	Europe
Phone +1 (970) 339 7009 Monday - Saturday 24 hours per day	Phone +44 (1429) 865511 Monday - Friday 8.30 a.m. - 6.00 p.m. Central European Time
Fax +1 (970) 330 7655	Fax +44 (1429) 866000
Mail US Driver Fulfillment for Hewlett-Packard PO Box 1754, Greeley, Colorado 80632 USA	Mail European Fulfillment for Hewlett-Packard c/o StarPak International, Ltd., Hartlepool, Cleveland, TS25 2YP United Kingdom

Australia	Asia - Pacific
Phone + 61 (2) 565 6099 Monday - Friday 8.30 a.m. - 5.30 p.m. Australian Eastern Time	Phone + 65 740 4477 Monday - Friday 8.30 a.m. - 5.30 p.m. Singapore Time
Fax + 61 (2) 519 5631	Fax + 65 740 4499
Mail Fulfill: Plus Pty Ltd., Private Bag 75, Alexandria NSW Australia 2015	Mail Fulfill: Plus Pte Ltd., No 51, Ubi Ave. 3, Singapore 1440

To identify a specific BIOS, driver or utility for your PC, please follow the steps listed below prior to placing your order.

- Contact your authorized HP reseller for assistance in selecting the appropriate driver.
- If your reseller is unable to help you, call HP FIRST for the most up-to-date list of drivers.

HP Support Services

Hewlett-Packard provides a three year hardware warranty which includes on-site service during the first year after purchase, and a return service during the second and third years after purchase. This warranty coverage will apply from the nearest HP or HP authorized service outlet.

HP telephone support for your Vectra PC is available during the first year of your hardware warranty. This service will also provide technical assistance with the basic configuration and setup of your Vectra PC and for the bundled or pre-loaded operating system.

Lifeline Telephone support is available during the second and third years of hardware warranty, via the Lifeline program, which is a fee-based service.

HP does NOT provide support for Vectra PCs configured as network servers. We recommend HP NetServers for your network server requirements.

NOTE

Reloading the software bundled or pre-loaded on your PC is not covered by the HP three-year warranty.

For your bundled application, HP recommends that you keep the master CD-ROM.

Your HP authorized reseller offers various service contracts which can be tailored to your particular support needs.

Hewlett-Packard Telephone Support

HP North American Customer Support Center

Assistance from the HP North American Customer Support Center is available Monday to Friday, 7:00 am to 6:00 pm Mountain time.

The number is: +1 (970) 635-1000

HP European Customer Support Center

Assistance from the HP European Customer Support Center is available Monday to Friday, 8:30 am to 6:00 pm Central European time.¹

Country	Language	Local Number
United Kingdom	English	0171 512 5202
Ireland	English	01 662 5525
Netherlands	Dutch	020 606 8751
Belgium	Dutch	02 626 8806
	French	02 626 8807
Switzerland	French	084 880 1111
	German	084 880 1111
Germany	German	0180 525 8143
France	French	04 50 43 9853
Austria	German	0660 6386
Norway	Norwegian	22 11 6299
Denmark	Danish	3929 4099
Sweden	Swedish	08 619 2170
Italy	Italian	02 26410350
Spain	Spanish	902 321 123
Portugal	Portuguese	01 441 7199

1. For non-listed European countries, support is available in English by calling +44 171 512 5202.

4 Hewlett Packard Support and Information Services

Lifeline Telephone Support

Please have the following information ready when you call so that your enquiry can be dealt with quickly:

- your HP Vectra model number and serial number (found on a label on your PC)
- the operating system version and the configuration
- a description of the software installed and the accessories used.

Lifeline Telephone Support

Lifeline is a fee-based telephone support program for Vectra PCs available after the one-year telephone support provided as part of the hardware warranty has expired.

Your call can either be charged to your phone bill at a per minute rate or to your credit card (Visa, Mastercard or American Express) at a flat fee.

The charge begins AFTER you have been put in contact with a support technician. If your problem is found to be covered by the HP Hardware Warranty, no charge will be applied.

In the US please call the appropriate number listed below.

Number	Method of Payment	Charge Type
1 (900) 555-1500	Charged to phone bill	per minute rate
1 (800) 999-1148	Charged to credit card	Flat fee

In Europe, please call the telephone support center (+44 171 512 5202).

Free access to HP information services is not affected by this service. You are encouraged to access HP Information Services throughout the life of your PC, whether in or out of warranty.

HP Network Phone-in Support Service (NPS)

The HP Network Phone-in Support Service (NPS) provides fast access to HP experts in networked Multivendor environments.

It can help you to:

- resolve complex network problems,
- leverage HP's alliances with leading Network Operating Systems and Network manufacturers,
- support your HP and non-HP products with a single telephone call,
- increase network uptime.

You can purchase the HP NPS service as an annual contract, billable in advance annually, bi-annually, quarterly, or at an hourly rate. This contract service provides unlimited toll-free access to HP Response Center Engineers (RCEs).

To obtain an HP NPS contract, contact your HP authorized reseller, or if you are in the US call (800) 437-9140.

4 Hewlett Packard Support and Information Services

Summary

Summary

The table below summarizes the services and support available from HP or authorized resellers.

Service	Covers	Period covered	Response time	Fee	When available	Purchase from
Basic Warranty	Parts and labor for HP products: first year on-site, second and third year return to HP.	Three years from date of purchase.	Next working day for on-site.	No charge.	At time of purchase.	HP.
HP SupportPack on-site service	Parts and labor for HP products.	First three years.	Next working day.	One fee which covers the three years.	Within 90 days of purchase.	HP Authorized reseller.
HP Support Assistant	CD-ROM containing: Product Manuals, Technical Information and Product features.	Released quarterly.	N/A	Annual subscription.	Anytime.	HP.
Electronic services	Technical information, drivers, utilities, tools and diagnostics.	Anytime.	24-hour access.	No charge.	Anytime.	HP BBS, WWW, CompuServe, America Online.
Technical Phone support	Basic assistance for PC setup, configuration, start-up and hardware diagnosis.	First year.	Business hours.	No charge.	At time of purchase.	HP.
Lifeline phone support	Basic assistance for PC setup, configuration, start-up and hardware diagnosis.	After first year.	Business hours.	Per-call fee, no time limit.	Anytime after first year.	HP.
HP Network Phone-in support	Advanced remote technical support for multivendor networked environments.	Annual contract.	Business hours: 24-hour/ 7-day service also available.	Annual fee, or minimum fee per incident.	Anytime.	HP Authorized reseller.
Service Contracts	Technical Support.	Customer defined.	As required.	Annual fee, or fee per incident.	Anytime.	Reseller.

Hewlett-Packard Marketing Headquarters

Should you wish to contact Hewlett-Packard, check your local telephone directory for the HP Sales and Service Office near you. If you cannot find a convenient HP office, you can write to one of the major HP Sales and Service Offices or one of the Worldwide Marketing Headquarters listed here.

ASIA

Far East Sales Region Hdqtrs
Hewlett-Packard Asia Ltd.
22/F Peregrine Tower
Lipp Centre
89 Queensway, Central
Hong Kong

Hewlett-Packard LATIN AMERICA

Prolongación Reforma No. 700
Col. Lomas de Santa Fe
Del. Alvaro Obregón
México
01210 Mexico, D.F.

EUROPE

European Operations Hdqtrs
Hewlett-Packard S.A.
150, route du Nant-d'Avril
P.O. Box 1217
Meyrin 2/Geneva
Switzerland

USA

Intercon Operations Hdqtrs
Hewlett-Packard Company
3495 Deer Creek Road
P.O. Box 10495
Palo Alto, CA 94303-0896
USA

MIDDLE EAST / AFRICA

Middle East / Central Africa Sales Hdqtrs
Hewlett-Packard S.A.
Rue de Veyrot 39
CH-1217 Meyrin 1/Geneva
Switzerland

CANADA

Hewlett-Packard Ltd.
6877 Goreway Drive
Mississauga
Ontario L4V 1M8
Canada

4 Hewlett Packard Support and Information Services

Hewlett-Packard Marketing Headquarters

Glossary

10Base-T Refers to the 10 Mbit/s Ethernet network technology over category 5 UTP (unshielded twisted pair) cable that is compatible with the proposed IEEE 802.3 standard.

accessory board Additional capabilities can be added to your PC by installing accessory boards. Your PC has between four and six slots. Depending on how your PC is configured, one or more accessory boards may already be installed.

adapter An accessory board, that connects to the system board via an accessory board slot.

BBS Bulletin Board System. A computer that uses a modem and software to serve as an information source for other computers equipped with a modem. Hewlett-Packard has a BBS that can be reached at +1 (408) 553-3500.

BIOS Basic Input-Output System. Software that provides an interface between the computer hardware and the operating system.

bus An electrical connection over which information is transported.

cache A block of high-speed memory used for the temporary storage of data and processor instructions.

CD-ROM Compact Disc Read Only Memory. A mass storage device that uses compact disc technology. CDs can store data, but most cannot be written to.

CMF Filename extension for sound files saved in the Creative Labs, Inc. music data file format.

CMOS Complementary Metal-Oxide Semiconductor memory requires very little power to operate. The contents of your computer's CMOS memory are preserved when you turn off the computer. It is used to store information that must be maintained, such as your computer's configuration.

Color map The color options in a graphics system, arranged by index number. Typically, the system has a default color map. The index of colors in the color map can be reallocated, depending on the application. There is one color map in the hardware (often called a color lookup table), but many color maps can be allocated in software and indexed as appropriate for separate applications.

controller A device that enables another device (such as a hard disk) to communicate with the computer.

DDC Display Data Channel. This is a Plug & Play specification for displays. It allows the PC to automatically configure the best refresh rate for your display.

device driver Software that enables the computer to interface with a specific peripheral, such as a printer or display.

Glossary

Double buffering The process of using two frame buffers for smooth animation. Graphical contents of one frame buffer are displayed while updates occur on the other buffer. When the updates are complete, the buffers are switched. Only complete images are displayed, and the process of drawing is not shown. The result is the appearance of smooth animation.

DIMM Dual In-line Memory Module. These memory modules provide a 64-bit data path for improved system performance.

Eight-bit color The color range possible with an eight-bit graphics system. Each pixel in an 8-bit system can display one of 256 colors (2⁸) at any given time. These colors are typically obtained from a color map.

expansion slot A slot inside the computer, connected to the system board, that can be used for accessory boards.

extended memory Memory which can be addressed by the processor in the area of memory above the first 1 MB.

Frame buffer Display memory that temporarily stores (buffers) a full frame of picture data at one time. Frame buffers are composed of arrays of bit values that correspond to the display's pixels. The number of bits per pixel in the frame buffer determines the complexity of images that can be displayed.

Graphical user interface (GUI)

The graphical user interface (GUI) provides the user with a method of interacting with the computer and its special applications, usually via a mouse or another selection device. The GUI usually includes such things as windows, an intuitive method of manipulating directories and files, and icons.

IDE Integrated Device Electronics. An interface standard for communications between the computer and a hard disk or CD-ROM.

IRQ Interrupt Request. A signal, that when received by the processor, halts the current process and allows a different task to be undertaken.

ISA Industry Standard Architecture. The ISA bus is the system bus originally used on the IBM PC/XT and IBM PC/AT computers. The version of the bus used on the AT is often referred to as the AT bus. The XT bus is 8 bits wide and the AT bus is 16 bits wide. The AT bus has become a de facto industry standard.

jumper An electrically-conductive part that is used to connect two or more points on a circuit board. Commonly used to select configuration options.

LAN Local Area Network. A general-purpose communications network that interconnects a variety of devices within a limited geographical area. A LAN might connect computers on adjacent desks, within a building, or

Glossary

within several buildings of a campus.

Mapping The transformation of one coordinate system into another. In the 3-D viewing pipeline, for instance, an object is defined by the application developer in model coordinates; these are mapped to world coordinates, the world coordinates are mapped to normalized device coordinates (NDCs); the NDCs are mapped to device coordinates; and the final picture is displayed. Also, an application for computer graphics systems. See geographic mapping, and geographic information systems.

mass storage Any device used to store large amounts of data. Usually refers to hard disks and tape backup units.

memory modules Miniature boards containing memory chips. Used for increasing the amount of memory available in the computer.

MID files Standard file format used to store MIDI sequence information.

MIDI Musical Instrument Digital Interface. An international hardware/software standard that specifies the cable and hardware interface that allows several devices, instruments, and computers to interchange music codes and events.

multimedia Combining static media (such as text and pictures) with dynamic data (such as sound, video, and animation) on the same system.

network adapter An accessory board that connects a computer to the cables of a network and transmits the type of signals used throughout the network. On some computers, mainly portables, the adapter may be an external device, rather than a board.

network server mode A security feature that prevents unauthorized use of an input device (like a keyboard or mouse) while your computer is running as an unattended network server.

OLE Object Linking and Embedding. A Windows feature that allows different object types (such as speech clips or notes of music) to appear in a document. The objects can be linked, in which case they remain separate files, or embedded, where they become a part of the document.

PCI Peripheral Connect Interface. The PCI local bus is a high performance, 32-bit or 64-bit bus with multiplexed address and data lines. It is intended for use as an interconnect mechanism between highly integrated peripheral controller components, peripheral add-in boards, and processor/memory systems.

pixel Picture element. The smallest addressable spot on the screen.

Plug & Play Plug & Play is an architecture designed to simplify installation and configuration of new devices in a PC.

Glossary

POST Power-On Self-Test. A series of tests your computer performs when you switch the computer on.

RAM Random Access Memory. This memory is used to hold programs and data temporarily.

resolution A measure of the visible detail on a screen or printout. Screen resolution is measured in 'pixels across' by 'pixels down' by 'number of colors'. Printer resolution is measured in dpi (dots-per-inch).

ROM Read-Only Memory. Computer memory used to store parts of the computer's operating system permanently. ROM chips can contain instructions and data.

Setup program Used to set the computer's configuration, for example the amount of memory installed. The setup program is stored in ROM on the system board.

shadow RAM A method of relocating the system and/or video BIOS from slower ROM chips to faster RAM to improve system performance.

SIMM Single In-line Memory Module. These memory modules can provide a 32-bit data path.

Sound files Files containing sound data. Sound files are usually stored in one of four formats, with the extension .WAV, .MID, .VOC, or .CMF.

True color Also known as RGB

color or 24-bit color. True color graphics systems are usually equipped with at least 24 bits per pixel. In the 24-bit system, for instance, three primary colors in the color graphics system—red, green and blue—are allotted 8 bits each. There are 28, or 256 intensities each for red, green and blue. This translates to a total palette range of 16.7 million colors (256 x 256 x 256). Because the human eye cannot detect the subtlety available in a palette of 16.7 million colors, this range makes it possible to compute what appears to be gradual shading.

video controller A chip or expansion card which converts signals in the computer into displayable signals.

video RAM Memory that enables or speeds up drawing to the screen or increases resolution or color options.

VOC files Proprietary digital audio format developed by Creative Labs, Inc. Most digital audio adheres to the Microsoft WAV format.

WAV files A Microsoft file format for storing digital audio data.

Windows RAM (WRAM) Dual-ported memory, which allows for simultaneous input of data from the graphics controller and output of data to the display.

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Regulatory Information and Warranty

Regulatory Information

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: HEWLETT-PACKARD

Manufacturer's Address: 5 Avenue Raymond Chanas
38320 Eybens, FRANCE

Declares that the product:

Product Name: Personal Computer

Model Number: HP Vectra VL 6/xxx
Models DT and MT

Conforms to the following Product Specifications:

SAFETY

International: IEC 950: 1991 + A1 + A2 + A3
Europe: EN 60950: 1992 + A1 + A2

EMC

CISPR 22: 1993 / EN 55022: 1994 Class B
EN 50082-1: 1992
IEC 801-2: 1992 / prEN 55024-2: 1992 - 4 kV CD, 8 kV AD
IEC 801-3: 1984 / prEN 55024-3: 1991 - 3 V/m
IEC 801-4: 1988 / prEN 55024-4: 1992 - 0.5 kV Signal Lines,
1 kV Power Lines

IEC 555-2:1982 + A1:1985 / EN 60555-2:1987
IEC 1000-3-3:1994 / EN 61000-3-3:1995

Supplementary information: The product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC, both amended by Directive 93/68/EEC, and carries the CE marking accordingly.



Grenoble
February 1997

Jean-Marc JULIA
Product Quality Manager

FCC (for USA only)

Federal Communications Commission Radio Frequency Interference Statement

Warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help.

Hewlett-Packard's FCC Compliance Tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your system. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Notice for Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Safety Warning for the USA and Canada

If the power cord is not supplied with the computer, select the proper power cord according to your local national electric code.

USA: use a UL listed type SVT or SJT detachable power cord.

Canada: use a CSA certified detachable power cord.

For your safety, never remove the PC's cover without first removing the power cord and any connection to a telecommunication network. Always replace the cover before switching on again.

Si le cordon secteur n'est pas livré avec votre ordinateur, utiliser un cordon secteur en accord avec votre code électrique national.

USA: utiliser un cordon secteur "UL listed", de type SVT ou SJT.

Canada: utiliser un cordon secteur certifié CSA.

Pour votre sécurité, ne jamais retirer le capot de l'ordinateur sans avoir préalablement débranché le cordon secteur et toute connection à un réseau de télécommunication. N'oubliez pas de replacer le capot avant de rebrancher le cordon secteur.

Changing a battery

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery in this PC is a lithium battery which does not contain heavy metals, nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, to the dealer from whom you purchased the PC, or to Hewlett Packard, so that they can either be recycled or disposed of in an environmentally sound way. Returned used batteries will be accepted free of charge.



Bij dit apparaat zijn batterijen geleverd. Wanneer deze leeg zijn, moet U ze niet weggooien maar inleveren als KCA.

Changement de la pile

Il y a danger d'explosion lorsque la pile n'est pas installée correctement. Pour votre sécurité, ne jamais essayer de recharger, de démonter ou de brûler l'ancienne pile. Remplacer uniquement avec une pile du même type ou d'un type équivalent recommandé par HP. La pile de cet ordinateur est une pile au lithium qui ne contient pas de métaux lourds, néanmoins, afin de protéger l'environnement, il ne faut pas la jeter dans les ordures ménagères mais la rendre au magasin où vous l'avez achetée, ou revendeur où vous avez acheté l'ordinateur, ou à Hewlett Packard, pour qu'elle soit recyclée, ou stockée de manière qui ne nuit pas à l'environnement. Les piles usées seront acceptées gratuitement.

Notice for the United Kingdom

The HP Vectra PC is approved under approval number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

Hinweis für Deutschland: Geräuschemission

Lärmangabe nach Maschinenlärmverordnung - 3 GSGV (Deutschland)
LpA < 70 db am Arbeitsplatz normaler Betrieb nach EN27779: 11.92.

Warnung

Wenn die Batterie nicht korrekt eingebaut wird, besteht Explosionsgefahr. Zu ihrer eigenen Sicherheit sollten Sie nicht versuchen, die Batterie wiederaufzuladen, zu zerlegen oder die alte Batterie zu verbrennen. Tauschen Sie die Batterie nur gegen den gleichen oder ähnlichen Typ aus, der vom Hersteller empfohlen wird. Bei der in diesem PC integrierten Batterie handelt es sich um eine Lithium-Batterie, die keine Schwermetalle enthält. Batterien und Akkumulatoren gehören nicht in den Hausmüll. Sie werden vom Hersteller, Händler oder deren Beauftragten kostenlos zurückgenommen, um sie einer Verwertung bzw. Entsorgung zuzuführen.

Notice for Japan

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Notice for Korea

이 기기는 비업무용으로 전자파장애검정을 받은 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

HP Hardware Warranty

Important: This is your hardware product warranty statement. Please, read it carefully.

Warranty terms may be different in your country. If so, your Authorized HP Dealer or Hewlett-Packard Sales and Service Office can give you details.

Three Year Limited Hardware Warranty

Hewlett-Packard (HP) warrants this hardware product against defects in materials and workmanship for a period of three years from receipt by the original end-user purchaser.

The three year warranty includes on-site service during the first year of use (free parts and labor), and return service provided by an HP Service Center or a participating Authorized HP Personal Computer Dealer Repair Center, during the second and third years of use (free parts only).

If HP receives notice of above defined defects during the warranty period, HP will either, at its option, repair or replace products which prove to be defective.

Should HP be unable to repair or replace the product within a reasonable amount of time, the customer's alternate exclusive remedy shall be a refund of the purchase price upon return of the product.

Limitation of Warranty

The above warranty shall not apply to defects resulting from: misuse; unauthorized modification; operation or storage outside the environmental specifications for the product; in-transit damage; improper maintenance; or defects resulting from use of non-HP software, accessories, media, supplies, consumables, or such items not designed for use with the product.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

HP MAKES NO OTHER EXPRESS WARRANTY, WHETHER WRITTEN OR ORAL, WITH RESPECT TO THIS PRODUCT. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS IS LIMITED TO THE THREE-YEAR DURATION OF THIS WRITTEN WARRANTY. SOME STATES OR PROVINCES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, or province to province.

Limitation of Liability and Remedies

THE REMEDIES PROVIDED ABOVE ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HP BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

The foregoing limitation of liability shall not apply in the event that any HP product sold hereunder is determined by a court of competent jurisdiction to be defective and to have directly caused bodily injury, death, or property damage; provided, that in no event shall HP's liability for property damage exceed the greater of \$50,000 or the purchase price of the specific product that caused such damage. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages—including lost profit—so the above limitation or exclusion may not apply to you.

Obtaining On-Site Warranty Service

To obtain on-site warranty service, the customer must contact an HP Sales and Service Office (in the US, call the HP Customer Support Center at (303) 635-1000) or a participating Authorized HP Personal Computer Dealer Repair Center. The customer must be prepared to supply proof of the purchase date.

This warranty is extended worldwide under certain conditions (please, check with your local HP office) to products purchased from HP or an Authorized HP Personal Computer Dealer which are reshipped by the original purchaser either for use by the original purchaser or provided as an incidental part of systems integrated by the original purchaser. When available in the country of use, service is provided in the same manner as if the product was purchased in this country and can only be provided in countries where the product is designed to operate. If the product is not normally sold by HP in the country of use, it must be returned to the country of purchase for service. Response time for on-site service, and turn-around time for return service, are subject to changes from standard conditions based upon non-local parts availability.

The system processor unit, keyboard, mouse, and Hewlett-Packard accessories inside the system processor unit—such as video adapters, mass storage devices, and interface controllers—are covered by this warranty.

Customer-replaceable components may be serviced through expedited part shipment. In this event, HP will prepay shipping charges, duty, and taxes; provide telephone assistance on replacement of the component when necessary; and pay shipping charges, duty, and taxes for any part that HP asks to be returned.

HP products external to the system processor unit—such as external storage subsystems, displays, printers, and other peripherals—are covered by the applicable warranties for those products; HP software is covered by the HP Software Product Limited Warranty.

On-site visits caused by non-Hewlett-Packard products—whether internal or external to the system processor unit—are subject to standard per-incident travel and labor charges.

On-site service for this product is restricted or unavailable in certain locations. In HP Excluded Travel Areas—areas where geographical obstacles, undeveloped roads, or unsuitable public transportation prohibit routine travel—service is provided on a negotiated basis at extra charge.

Response time for HP on-site service in an HP Service Travel Area is normally next business day (excluding HP holidays) for HP Travel Zones 1-3 (generally 100 miles or 160 Km from the HP office). Response time is second business day for Zones 4 and 5 (200 miles, 320 Km); third business day for Zone 6 (300 miles, 480 Km); and negotiated beyond Zone 6. Worldwide Customer Support Travel information is available from any HP Sales and Service Office.

Travel restrictions and response time for dealer or distributor service are defined by the participating dealer or distributor.

Service contracts which provide after-hour or weekend coverage, faster response time, or service in an Excluded Travel Area are often available from HP, an authorized dealer, or authorized distributor at additional charge.

Customer Responsibilities

The customer may be required to run HP-supplied diagnostic programs before an on-site visit or replacement part will be dispatched.

The customer is responsible for the security of its proprietary and confidential information and for maintaining a procedure external to the products for reconstruction of lost or altered files, data, or programs.

For on-site service, the customer must provide: access to the product; adequate working space and facilities within a reasonable distance of the product; access to and use of all information and facilities determined necessary by HP to service the product; and operating supplies and consumables such as the customer would use during normal operation.

When service is being performed on-site, a representative of the customer must be present at all times. The customer must state if the product is being used in an environment which poses a potential health hazard to repair personnel; HP or the servicing dealer may require that the product be maintained by customer personnel under direct HP or dealer supervision.

Obtaining Return Warranty Service

When return warranty service applies, the product must be returned to a service facility designated by HP. Customer must enclose a copy of a document proving date of purchase.

The customer shall prepay shipping charges (and shall pay all duty and taxes) for products returned to HP for warranty service. HP shall pay for return of products to the customer except for products returned to the customer from another country.

(Rev. 20/11/96)

HP Software Product License Agreement and Software Product Limited Warranty

Your HP Vectra PC contains preinstalled software programs. Please read the Software License Agreement before proceeding.

CAREFULLY READ THIS LICENSE AGREEMENT AND LIMITED WARRANTY STATEMENT BEFORE PROCEEDING TO OPERATE THIS EQUIPMENT. RIGHTS IN THE SOFTWARE ARE OFFERED ONLY ON THE CONDITION THAT THE CUSTOMER AGREES TO ALL TERMS AND CONDITIONS OF THE LICENSE AGREEMENT. PROCEEDING TO OPERATE THE EQUIPMENT INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THE TERMS OF THE LICENSE AGREEMENT, YOU MUST NOW EITHER REMOVE THE SOFTWARE FROM YOUR HARD DISK DRIVE AND DESTROY THE MASTER DISKETTES, OR RETURN THE COMPLETE COMPUTER AND SOFTWARE FOR A FULL REFUND. PROCEEDING WITH CONFIGURATION SIGNIFIES YOUR ACCEPTANCE OF THE LICENSE TERMS.

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PRODUCT RECOVERY CD-ROM. If your computer was shipped with a product recovery CD-ROM: (i) The product recovery CD-ROM and/or support utility software may only be used for restoring the hard disk of the HP computer with which the product recovery CD-ROM was originally provided. (ii) The use of any operating system software by Microsoft contained in any such product recovery CD-ROM shall be governed by the Microsoft End User License Agreement (EULA).

TRANSFER OF RIGHTS IN SOFTWARE. Customer may transfer rights in the software to a third party only as part of the transfer of all rights and only if Customer obtains the prior agreement of the third party to be bound by the terms of this License Agreement. Upon such a transfer, Customer agrees that his/her rights in the software are terminated and that he/she will either destroy his/her copies and adaptations or deliver them to the third party.

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TERMINATION. Hewlett-Packard may terminate this software license for failure to comply with any of these terms provided Hewlett-Packard has requested Customer to cure the failure and Customer has failed to do so within thirty (30) days of such notice.

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HP Software Product Limited Warranty

THIS HP SOFTWARE PRODUCT LIMITED WARRANTY SHALL COVER ALL SOFTWARE THAT IS PROVIDED TO YOU, THE CUSTOMER, AS PART OF THE HP COMPUTER PRODUCT, INCLUDING ANY OPERATING SYSTEM SOFTWARE. IT SHALL SUPERSEDE ANY NON-HP WARRANTY TERMS THAT MAY BE FOUND ON-LINE, OR IN ANY DOCUMENTATION OR OTHER MATERIALS CONTAINED IN THE COMPUTER PRODUCT PACKAGING.

Ninety-Day Limited Software Warranty. HP warrants for a period of NINETY (90) DAYS from the date of the purchase that the software product will execute its programming instructions when all files are properly installed. HP does not warrant that the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, Customer's remedy shall be a refund or repair. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

Removable Media (If supplied). HP warrants the removable media, if supplied, upon which this product is recorded to be free from defects in materials and workmanship under normal use for a period of NINETY (90) DAYS from the date of purchase. In the event the media proves to be defective during the warranty period, Customer's remedy shall be to return the media to HP for replacement. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and destruction of all other non removable media copies of the software product.

Notice of Warranty Claims. Customer must notify HP in writing of any warranty claim not later than thirty (30) days after the expiration of the warranty period.

Limitation of Warranty. HP makes no other express warranty, whether written or oral with respect to this product. Any implied warranty of merchantability or fitness for a particular purpose is limited to the 90-day duration of this written warranty. Some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives specific legal rights, and you may also have other rights which vary from state to state, or province to province.

Limitation of Liability and Remedies. THE REMEDIES PROVIDED ABOVE ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HP BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT) WHETHER BASED ON WARRANTY, CONTRACT, TORT OR ANY OTHER LEGAL THEORY. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

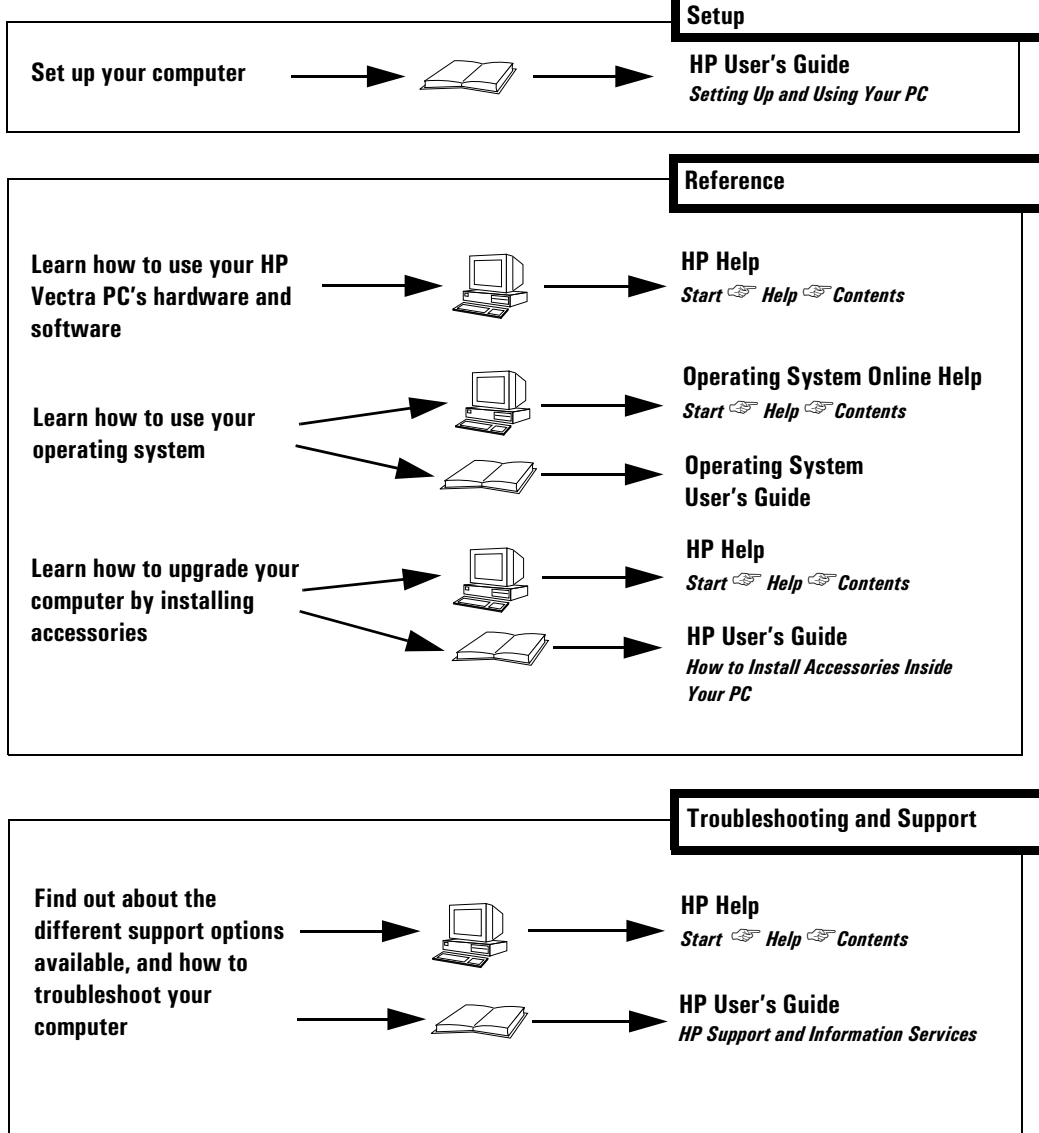
Obtaining Warranty Service. Warranty service may be obtained from the nearest HP sales office or other location indicated in the owner's manual or service booklet.

Consumer transactions in Australia and the United Kingdom: The disclaimers and limitations above shall not apply and shall not affect the statutory rights of a Consumer.

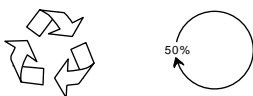
(Rev. 19/11/96)

PC Documentation Roadmap

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